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## BIG MAJOR ON CAMPUS

While enrollment for traditional computer science degrees are slightly on the rebound, those in MIS programs are through the roof, with many schools reporting 300% enrollment gains. Page 44

## NEVER TOO THIN

Corporate IT is moving toward a thin-client model to cut costs, relieve management headaches, ease software upgrades and bolster security, but these thin clients look a lot like PCs. Page 62



# COMPUTERWORLD THIS WEEK

JULY 10, 2000

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## This Week Online



Make sure to stop by our redesigned Web site to check out what's happening on our new Community Pages:

■ **Computerworld.com** features an interesting discussion with Computerworld technology evaluations editor Robert Mitchell (above) on our Windows 2000 Community Page. Mitchell is discussing new MCSE requirements and how Microsoft may be throwing the baby out with the bathwater.

■ Also **Hal Lowy**, vice president of global marketing and partnerships at SGSSonSITE, talks about **security** and **trust** online in our B-to-B/E-commerce Community.

- dicts that eCRM will yield twice the payoffs of ERP — or twice the problems.
- 47 JOE AUER** says software rights and obligations issues are hugely important in negotiating outsourcing deals.
- 78 FRANK HAYES** warns that domain-name bills and renewable software licenses are the quickest way for IT to get itself in hot water.

## AT DEADLINE

### Compaq, IBM Sign Storage Pact

Compaq Computer Corp. and IBM last week announced a long-term, \$1 billion agreement to sell each other's storage software and hardware. Compaq CEO Michael Capellas predicted that the deal will improve the interoperability of storage networking technology, thus making such networks easier for enterprises to deploy and manage.

Under the terms of the deal, Compaq will sell IBM's high-end Smart storage servers and some systems management software from Tivoli Systems Inc. in Austin, Texas. In return, IBM will sell Compaq's StorageWorks Modular Array 8000 systems and software, which use IBM high-speed hard disk drives. IBM will also support Compaq's Versastore software, which guides various platforms to help users find files in a single data storage area.

### Online Privacy Guidelines Released

The 300-member Internet Advertising Bureau (IAB) last week released its first-ever voluntary online privacy guidelines. The guidelines set minimum acceptable standards for collecting and using information gleaned from visitors to members' Web sites.

Members of the New York-based IAB will be required to establish and post online privacy policies that will explain what data is being collected about site visitors and how the information will be used and stored, along with a statement about the security of the information.

### Qwest/US West Deal Means Layoffs

Joseph Nauchoff, chairman and CEO of Qwest Communications International Inc., last week said the Denver-based telecommunications and broadband Internet services vendor will lay off workers and close some offices in the wake of the completion of its \$4.5 billion acquisition of US West Inc. In Englewood, Colo., on June 30, Nauchoff didn't specify how many of the combined company's 71,000 employees will be let go in order to eliminate redundancies created by the merger.

# Vendor Woes Underscore Big-Iron App Licensing Angst

**But analysts say weak CA, BMC earnings might not mean a broader slowdown**

BY JACKUMAR VIJAYAN

**A** COMBINATION of several long-standing software pricing issues and word of an earlier-than-expected release of a new generation of IBM mainframes later this year contributed to the disastrous quarter Computer Associates International Inc. and BMC Software Inc. announced last week.

But their woes aren't necessarily indicative of a broader industry-wide mainframe sales slowdown, analysts said.

Both CA and BMC stunned Wall Street last week with dramatically reduced earnings forecasts. Islands, NY-based CA, which was expected to report first-quarter earnings of 55 cents per share, lowered its estimates to 26 cents per share. Meanwhile, Houston-based BMC said it would earn 18 to 21 cents per share, compared with expectations of 46 cents per share.

Both companies blamed their results on lower-than-expected mainframe software sales — particularly in Europe — and on their inability to close several major contracts.

#### Contributing Factors

Several short- and long-term issues may be contributing to that situation, said users and analysts, such as the following:

- Software prices that continue to grow steeply even as hardware prices are dropping. Corporations spend up to 10 times more on mainframe software than on S/390 hardware upgrades, said Colin Rankine, an analyst at Cambridge, Mass.-based Giga Information Group Inc. As a result, there is a growing reluctance among corporate customers to enter into long-term (five-to seven-year) software licensing deals.
- A temporary slowdown in mainframe hardware sales in anticipation of IBM's next-generation 64-bit mainframes

— code named Freeway — which are expected to ship in the fourth quarter. The systems will not only provide nearly twice as much performance as current systems but should also generate more attractive software licensing and bundling schemes.

"Freeway may have put a hold on decision-making while companies evaluate the change [in the pricing and performance scenario]," said David Foyer, an analyst at ITcentrix Inc., a mainframe consultancy

in Mountain View, Calif.

"People are trying to see what [the new mainframe technology is like] and which vendors are going to play with" new pricing schemes for the systems, said Dan Kerson, parallel sysplex manager at Hewlett Associates LLC, a human resources outsourcing firm in Lincolnshire, Ill.

#### Customer Push

The slowdown in mainframe software sales may also indicate that users are finally pushing back against capacity-based licensing schemes that force customers to pay for software based on the size of their mainframe complexes rather

than on their actual use of the software, Rankine said.

"There is some civil disobedience going on for sure," he said. "People are canceling products and are negotiating much more aggressively" than before.

Connecticut Natural Gas in Hartford, for example, is slowly shifting its applications off of mainframes and onto client/server systems. Driving the move is a shortage of new mainframe applications, coupled with the rising cost of maintaining legacy software, said Joe Quimby, director of financial and administrative systems at the gas distributor.

Slowing MIPs sales as users absorb the excess capacity they installed in preparation for Y2K may also account for the depressed software sales, said Mike Egan, a mainframe software contract specialist at Stamford, Conn.-based Meta Group Inc.

For example, Egan negotiated 25 mainframe software licensing deals last September. This quarter, he handled only six deals. ■

#### MORE THIS ISSUE

For more on the companies' financial results, see page 75.

### Big (Iron) Hitters

*There was little to indicate a mainframe software slowdown until last week's unexpected earnings warning.*

	QUARTER ENDING 3/31/00	QUARTER ENDING 12/31/99
Computer Associates Revenue	\$2.13B	\$1.91B
Profit	\$551M	\$424.8M
BMC Software Revenue	\$470.4M	\$429.3M
Profit	\$123.2M	\$105.6M

## Microsoft Users Seek Answers at DevCon

**Middleware raises hopes, but users cautious about C#**

BY LEE CIPELLETTA

At Microsoft Corp.'s Professional Developers Conference in Orlando this week, users are hoping the computing giant will lift the covers on a slew of new initiatives.

For the past few weeks,

Microsoft has been doing out bits of information about its computing architecture's future. The linchpin initiative: Microsoft .Net, a middleware platform that will allow services to

be exchanged across Internet applications and devices.

But users said they have a lot of questions about other parts of that plan, including Microsoft's C# development language, Visual Studio .Net development tools, Component Object Model and protocols like XML and Simple Object Access Protocol.

Microsoft claims C# will

make it easier for C and C++ developers to create objects that run on the new Microsoft .Net infrastructure and interoperate with other platforms and applications. Microsoft has promised that C# will become an open standard.

Microsoft officials said they

will furnish more details on C# at the conference.

Meanwhile, users remain cautiously optimistic.

"From the top level, C# sounds conceptually like a good idea, but I'm still waiting for feedback from my troops about it," said Peter Janak, CIO at Delphi Automotive Systems Corp. in Troy, Mich.

C# "sounds good in theory," agreed Rodney Bergen, a developer at Des Moines Area Community College in Iowa.

"But I'm not sure everything will go Microsoft in the next three years, so learning another Microsoft language may not make sense at this time," he added. ■



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# Feds Oppose Net Access To Chemical Disaster Info

**Claims the public documents could aid terrorists in planning U.S. attacks**

BY PATRICK THIBODEAU

WASHINGTON

**T**HE Environmental Protection Agency (EPA) is poised to release a set of regulations meant to keep worst-case chemical disaster information off the Internet, where it would be easily accessible to terrorists. But a draft proposal is drawing mostly skepticism from all sides, with the consensus that it's impossible to keep public information off the Internet.

Chemical companies are required by law to provide the EPA with reports detailing what would happen in the event of a "worst-case" chemical release or explosion, like

the 1984 Bhopal, India, chemical disaster that killed more than 2,000 people. But in response to warnings by the U.S. Department of Justice that the information — if posted on the Internet — could provide "one-stop shopping" for terrorists, Congress passed a law last year barring the electronic distribution of the data.

#### A Matter of Time

As a result of that law, the EPA has drafted a proposal that would require the creation of 50 reading rooms across the U.S. where the public can view chemical and disaster information on thousands of companies. Users would have to show personal identification to view

the data and would be limited to accessing information about 10 chemical facilities a month. Moreover, users wouldn't be able to reproduce any of the material but could take notes. The EPA is expected to release its final regulation on Aug. 5, an agency official said.

But Donna Duesell, corporate environmental manager at R.T. Vanderbilt Co., a specialty chemical maker in Norwalk, Conn., said she believes that limiting access only increases amount of time it will take for the data to turn up on the Internet. "Maybe this is just my cynicism or skepticism, but the data will be out there," said Duesell, who said she believes availability of the information should be limited to the local community surrounding a given chemical facility.

In a letter to the EPA, Eastman Chemical Co. said the

proposed rule doesn't go far enough. The Kingsport, Tenn., company wants user access limited to 10 facilities per year rather than 10 per month.

Environmental and right-to-know groups have also faulted the plan.

"It severely limits the public's freedom to communicate about the dangerous practices in the chemical industry," said Paul Orum, director of the Working Group on Community Right-to-Know in Washington. The regulations, however, won't stop dissemination of the data, Orum said. "The information will get out, slowly, in a disorganized way," he said.

Industry trade groups are worried not only about security issues but about the use of public data to gain competitive intelligence. "I think that those conducting competitive espionage will use every means

## Paper or Internet?

The EPA wants the public to have access to "worst-case" chemical disaster scenarios but doesn't want this potentially terrorist-friendly information to appear on the Internet. The agency has drafted proposals that will be finalized Aug. 5.

The EPA will establish 50 reading rooms throughout the U.S. for public access to the disaster scenario materials.

• Users will have to show identification.

• No mechanical reproduction will be allowed, but visitors can take notes.

• Users will be limited to accessing information on 10 scenarios per month.

available to them, and this would be yet another data point available to them. So yes, it would have a competitive impact," said Michael Wallis, senior counsel at the American Chemistry Council Inc. in Arlington, Va. However, he said he believed the regulation will "substantially deter" release of the data on the Internet. ■

# Privacy Advocates Decry Sale of Toymart Records

**Truste says retailer is breaking contract**

BY LINDA ROSENCRANCE

An organization that developed a set of online data-privacy guidelines is taking legal action aimed at stopping failed Internet retailers from selling their customer lists and other information to third parties.

San Jose-based Truste said it plans to file a brief in a U.S. Bankruptcy Court in Massachusetts in an attempt to prevent Toymart.com Inc. from selling customer data as part of a liquidation process that began after the online toy store closed its virtual doors in May.

Toymart, which filed for Chapter 11 bankruptcy protection last month, included its customer lists and database among the items it wants to dispose of in a motion seeking the bankruptcy court's approval.

val for a public sale of the firm's remaining assets. The court gave Toymart permission to proceed with the bidding process pending a July 26 hearing on the public-sale motion.

But Toymart was a participant in Truste's program, and Truste spokesman Dave Steer claimed that the sale of the Waltham, Mass., company's customer records would violate Toymart's legally binding contract with Truste, as well as the privacy policy that was posted on Toymart's Web site.

"Toymart.com entered into a contract with their customers saying they would not release customer data to third parties," Steer said. "And we're making the assertion that Toymart is in breach of [that] contract and what it is doing is illegal." Truste has also asked the Federal Trade Commission (FTC) to investigate Toymart's actions, he added.

Toymart officials couldn't

be reached for comment, and Alex Rodolakis, one of the Boston-based attorneys representing the company in its bankruptcy case, didn't return a phone call. Meanwhile, a spokesman for the FTC said he could neither confirm nor deny that the commission is looking into the matter.

#### AT A GLANCE

## How Truste Works for Consumers

A Truste seal displayed on a Web site means that the company will disclose the following information to consumers:

- What personal information is being gathered about them
- How the information will be used
- The identity of third parties with whom the information will be shared
- Choices available to consumers regarding how the collected information will be used
- Safeguards in place to protect the information from loss, misuse or alteration
- How consumers can update or correct inaccuracies in their information

Toymart, which was majority-owned by The Walt Disney Co. in Burbank, Calif., is just one of about a half-dozen online retailers that went out of business this spring as funding began to dry up for unprofitable Internet ventures.

The controversy over the proposed sale of Toymart's customer list comes amidst a high-profile debate about whether the federal government should pass privacy legislation or continue allowing companies to regulate themselves.

Jason Catlett, president of privacy advocate Junkbusters Corp. in Green Brook, N.J., said a federally enforceable law is the only way to guarantee the privacy of online shoppers. "This is one of the many cases where the current legal processes are grossly unsatisfactory," he said.

"There's not a lot of law around the issue of privacy in the U.S.," said Jonathan Moxlin, an intellectual property lawyer at the New York law firm Fenster & Edmonds LLP. "But Truste may have a claim for breach of contract, which could very well result in the

court issuing an injunction against the sale proposed by Toymart."

The Toymart case last week prompted Rep. Spencer Bachus (R-Ala.) to announce plans to introduce legislation that would make it illegal for bankrupt companies to sell private information they originally told customers they wouldn't share.

Steer said Truste has also enlisted the help of Massachusetts Lt. Gov. Jane Swift and the state's attorney general. In June of last year, Swift filed privacy legislation aimed at protecting the personal information of Massachusetts consumers by preventing online companies from selling that data to third parties without an individual's consent.

But the bill is stalled in a legislative committee, and Swift said state government officials are trying to determine what, if anything, they can do in the Toymart case.

"There are a lot of questions about whether privacy protections are better considered at the [state] or federal level," she said. "But there's no movement in the [FTC]."

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1-800 FLOWERS.COM has adopted the Unicenter TNG solution to help them increase their network of flower delivery partners while helping cut costs through a more efficient and centralized system. The center has monitored and tracked 1-800 FLOWERS.COM's worldwide flower distribution system, enabling them to offer a wide variety of products without requiring extensive staff or equipment.

1-800 FLOWERS.COM's customer base is growing rapidly. To help ensure the continued success of 1-800 FLOWERS.COM's Internet strategy, Unicenter TNG will continue to provide the latest technology and support to help 1-800 FLOWERS.COM maintain its position as a leader in the Internet flower delivery industry.



# Unicenter TNG

## BRIEFS

### EDS Scores a Hit With Defense Contract

**E**lectronic Data Systems Corp. in Plano, Texas, has landed a \$2.1 billion contract with British defense contractor Rolls-Royce PLC to provide electronic-business, consulting and supply-chain management services. EDS said the agreement, which runs through 2012, extends a relationship signed in 1996 with Rolls-Royce's aerospace business.

### AOL Invests in Speech Software Company

**A**merica Online Inc. has taken a stake in SpeechWorks International Inc., a maker of voice-recognition software in Boston, to capitalize on the hot market for voice access to online services via telephone. Dulles, Va.-based AOL agreed to purchase \$5 million in SpeechWorks common stock, according to documents filed with U.S. securities regulators late last week by SpeechWorks. AOL may increase its initial investment - about 1% of SpeechWorks' stock - by exercising stock warrants that could give it up to 4% of the company. SpeechWorks filed to raise up to \$71 million in an initial public offering.

### Converse to Buy Exalink for \$480M

**W**ireless communications equipment maker Converse Technology Inc. agreed to acquire closely held Exalink Ltd. in Herdsey, Israel, for about \$480 million in stock. Woodbury, N.Y.-based Converse said the purchase gives it access to Exalink's mobile Internet platforms, including its Wireless Application Protocol gateway products, and its database for subscriber and platform management.

### NEC Plans for Mergers

**N**EC Corp., Japan's largest semiconductor maker and the world's second-largest, said it will establish a \$5.64 billion investment fund to spend mainly on U.S. mergers and acquisitions. The company also plans to list its stock on the New York Stock Exchange within the next three years.

# Verio to Reimburse Web Outage Victims

**B**ut meager compensation may not be enough to appease hard-hit customers

BY LEE COPPLEDO

**I**N RESPONSE to severe Web service outages, Verio Inc. plans to offer affected customers one month of free service — worth about \$150. But several users said that gesture doesn't begin to cover their mounting losses.

Officials at Verio, a Web hosting, e-mail and connectivity services firm in Englewood, Colo., last week blamed outages and service delays at more than 1,200 Web sites on problems with updating router configuration tables [Page One, July 3].

Some customers, such as Christopher Mott, president of Mott's Miniatures & Doll House Shop Inc. in Buena Park, Calif., couldn't take online orders for seven days. Mott said his site still wasn't fully functional late last week, costing him more than \$14,000 in sales.

"With 7% of my business coming from Internet sales, my losses will far exceed a voucher for one month's free hosting," he said. "I can't even begin to calculate the loss in terms of goodwill or customer confidence in our site and our company."

"The fact that they are giving us back \$100 or \$150 does not offset the thousands of dollars in productivity losses; throwing that bone is kind of a joke," said Michael Baratz, president of Automated Information Management Inc., a Lombard, Ill.-based Web development firm.

#### Customer Skepticism

Vero officials declined to comment further. "Nothing has changed since last week," said spokeswoman Maja Pelaquin. "It was a router problem. The service was restored."

"I have been told that it was always a router problem and that they were switching to a new data center. Yeah, right," said Charlie Nunemaker, direc-

tor of information systems at the North Shore-Barrington Association of Realtors in Northbrook, Ill. Because of "nightmare" Web-service outages and poor response times in the past seven months, Nunemaker said, he stopped using Verio for Web hosting and is looking for a new provider.

"Blaming the problems on a router sounds like a technical brush-off, because I can't imagine that they only have one

## Online Health Care Initiatives on the Rise

**Firms aim to reduce costs, boost services**

BY JULEENKA DASH

In an effort to lower costs and improve relationships with their customers, a growing number of health insurers are developing initiatives that allow members to request referrals, check eligibility and update enrollment online.

Users and analysts said that such electronic health services should save health firms time and money by reducing call center volume. That's critical, given that some 15% of health plan revenues are siphoned off to pay for administrative costs.

Getting there is the tricky

router," said analyst Michael Ebschloeg at Computer Economics Inc., a market research firm in Carlsbad, Calif., recommends that companies looking for a Web hosting firm do the following:

- Ask to see an outage log.
- Get a service-level agreement that spells out expectations.
- Speak directly with other customers.

vider three months ago, after he couldn't update his online clip-art firm's Web site for 10 consecutive days.

"Verio said the problem was with equipment on the return loop to us, but instead of helping, they said, 'It's not our problem; it's a router somewhere else.' So, why am I paying them?" said Sutphin. ■

lion per year, said Schaich.

Sierra also hopes to improve service levels by offering members the flexibility to receive information when it's convenient for them, said Schaich. Early next year, Sierra expects to add consumer health information to its Web site, [www.sierrahealth.com](http://www.sierrahealth.com).

Just as the banking industry has improved its customer service by offering account access online, the health insurance industry is recognizing the need to offer the same type of capabilities, said Doug Johnson, an analyst at Forrester Research Inc. in Cambridge, Mass. As employees grumble about rising health maintenance organization costs, one way for health plans to reduce costs is to improve administrative efficiencies through the use of Internet technologies, he said.

But as more health plans warm up to online health care services, challenges remain. Many plans have legacy systems that are "not developed to support online queries from thousands of users," said Johnson.

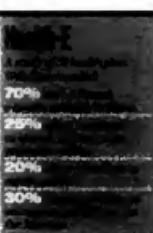
Meanwhile, less than 30% of physician's offices nationwide are connected to the Internet, said Mark Anderson, a vice president at Stamford, Conn.-based Meta Group Inc. and a former hospital CIO. ■

## AT A GLANCE

### Don't Let It Happen to You

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#### Customer Snapshot

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"Blaming the problems on a router sounds like a technical brush-off because I can't imagine that they only have one

router," said analyst Michael Erbschloe at Computer Economics Inc., a market research firm in Carlsbad, Calif. "Everyone has problems from time to time, but even if hardware fails, it can be swapped out in no time. This should not take five days."

"Lack of customer service has always been a black cloud over the company," said financial analyst Brent Bracelin in Pacific Crest Securities in Portland, Ore.

David Surprenant, president of Dream Maker Software in Englewood, Colo., switched from Verio to another service pro-

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# Online Health Care Initiatives on the Rise

**Firms aim to reduce costs, boost services**

BY JULSHNA DASH

In an effort to lower costs and improve relationships with their customers, a growing number of health insurers are developing initiatives that allow members to request referrals, check eligibility and update enrollments online.

Users and analysts said that such electronic health services should save health firms time and money by reducing call center volume. That's critical, given that some 15% of health plan revenues are siphoned off to pay for administrative costs.

Getting there is the tricky

part: Challenges for health care players include grappling with legacy systems and convincing doctors to go online.

#### Cost-Cutting Measures

Sierra Health Services Inc. in Las Vegas is piloting an Internet health care portal among a dozen groups, including physician practices, employers and insurance brokers, according to COO Bob Schach. The Tri-Zetto Group Inc. in Newport Beach, Calif., developed the application that enables members to enroll in health plans and select a primary care physician online.

Following the pilot phase, expected to be completed later this month, Sierra plans to extend the services to 350,000 members as well as additional physicians and employer groups. By then, physicians will be able to verify patient eligibility and submit referrals, and employers will be able to monitor enrollment, Schach said. Sierra's members are located throughout Nevada, Arizona, Texas and Colorado.

Sierra expects the Internet portal to cut its 1.6 million annual support calls by 20%. Based on health industry averages, which place call center support costs at \$3 per call, that would save Sierra almost \$1 mil-

lion per year, said Schach.

Sierra also hopes to improve service levels by offering members the flexibility to receive information when it's convenient for them, said Schach. Early next year, Sierra expects to add consumer health information to its Web site, www.sierrahealth.com.

Just as the banking industry has improved its customer service by offering account access online, the health insurance industry is recognizing the need to offer the same type of capabilities, said Doug Johnston, an analyst at Forrester Research Inc. in Cambridge, Mass. As employers grumble about rising health maintenance organization costs, one way for health plans to reduce costs is to improve administrative efficiencies through the use of Internet technologies, he said.

But as more health plans warm up to online health care services, challenges remain. Many plans have legacy systems that are "not developed to support online queries from thousands of users," said Johnston.

Meanwhile, less than 30% of physician's offices nationwide are connected to the Internet, said Mark Anderson, a vice president at Stamford, Conn.-based Meta Group Inc. and a former hospital CIO. ■





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## Help Desk Groups Merge to Mend Fences

BY MEGHAN HOLDHORN

In February of last year, some disgruntled members of the Help Desk Institute (HDI)

broke away from the professional organization to form a new group that would better serve their needs.

But now, after more than a year of confusion within the information technology help desk industry, Colorado

Springs-based HDI is joining forces with its splinter group, the Help Desk Professional Association (HDPA). The merger comes with the blessing of HDPA's founder, Ivy Meadors, who will take over as HDI's ad-

visory board chairman, according to Ken Webb, HDI's chief operating officer. Meadors couldn't be reached for comment.

Many of the groups' members applauded the news.

"What we really want is one organization, not three. Now there are two," said Eugene Ball, former president of the North Carolina chapter of HDI. "I think it will be good for industry."

The merger leaves Help Desk 2000 as the remaining alternative professional organization.

Peter McGarahan, chairman of Help Desk 2000 and former executive director of HDI, said that joining forces will be best for both HDI's and HDPA's members.

"With Ivy coming over to HDI, I would say the possibilities are stronger than ever for a cohesive agreement for the industry standards," he said.

HDI was founded by Ron Muns in 1989 to provide support for help desk employees. In 1992, he sold it to New York-based Ziff Davis Inc.

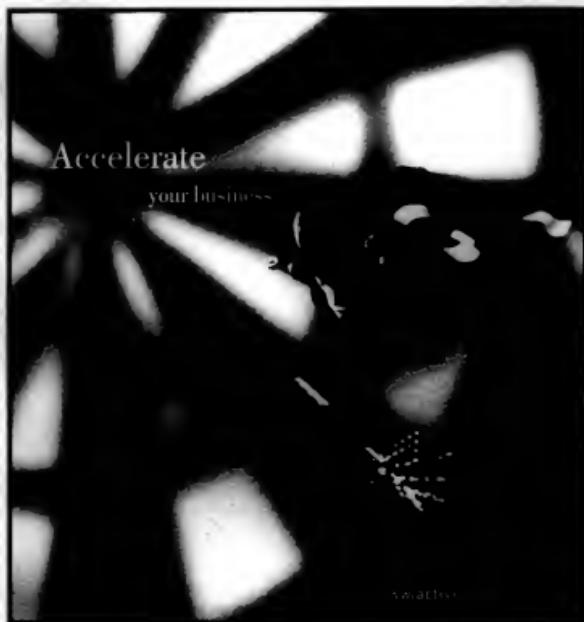
But members weren't happy about the new ownership, complaining that it wasn't providing the services it promised, such as regular publications. So, in March of last year, Muns bought HDI back from Ziff Davis.

"Since that time; they've made a large effort at identifying membership needs and fulfilling them," Ball said.

Sharon Hite, president of HDI's Raleigh-Durham, N.C., chapter, said she thinks the merger is advantageous because the combined organizations give members more networking opportunities.

But Margo Fullilove, a former chapter president and board member of HDI's Chicago chapter, said she wonders if HDI will be able to best serve members.

For instance, she said, the organization doesn't provide enough information for members who have advanced knowledge of help desk issues. Help desk professionals also need benchmarks, which HDI hasn't been able to provide, Fullilove said. ■



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**COMPAQ**

# VirtualBank Latest to Move Banking Off-line

**Will offer on-site banks at tech companies**

BY MARIA TROMBLY

**O**NEILL financier VirtualBank will become a player in the physical world this fall, when it opens two branches to serve its niche customers — employees of high-tech firms.

The Palm Beach Gardens, Fla.-based bank went live on April 17 and recently signed deals with three high-tech companies for which it will provide Internet banking as a convenience to employees.

Virtual Bank is not the only one to move online banking off-line. In March, Royal Bank of Canada, which owns online bank Security First Network, Bank in Atlanta, agreed to buy Prism Financial Corp., a mortgage bank. That deal would give Security First access to 150 branch offices.

And Menlo Park, Calif.-based ETrade Group Inc., which offers banking services in addition to online trading, recently purchased retail space in Minneapolis-based Target Corp.'s Super Target depart-

ment stores. ETrade also bought about 8,500 automated teller machines.

But analysts said VirtualBank is the first online bank to offer itself to employees as a credit union would.

In addition to putting up a physical branch in or near each of the companies' virtualbank will also create a co-branded Web site to serve those companies' employees, said President William Decker.

The first one, EMC/VirtualBank, will serve the 18,000 employees at EMC Corp. in Hop-

kinton, Mass. Later this year, VirtualBank will launch other Web sites to serve the 70,000 employees of Compaq Computer Corp. and the 68,000 workers at financial services provider Textraon Financial Corp., a subsidiary of Textraon Inc.

Decker added that VirtualBank hopes to reach 5% to 25% of the employees at each company it partners with.

"VirtualBank is doing a number of things that we would suggest online banks do," said Paul Jamieson, an analyst at Lincoln, Mass.-based Gomez Advisors Inc. "They're partnering with known brands

— in this case, employers —

## Off-line, On-site

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**The first co-branded sites, with EMC, are due next month.**

**EMC Corp., based in Hopkinton, Mass., 18,000 employees**

**Makes disk memory hardware and software for mainframes**

**Compaq Computer Corp., based in Houston, 70,000 employees**

**Makes personal computers**

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**Offers financial services to businesses and consumers**

issues that have been affecting online banking: awareness, trust and customers' wish for a physical presence.

"Our focus has been to go out and target companies that have good corporate brands," said Decker.

Internet banking can help a company's image, which is what attracted EMC.

"We offer a number of benefits," said EMC spokesman Rick Lacroix. "This provides an extra benefit to our employees and helps them balance the time demands of their work life and their personal life."

VirtualBank also assigns each customer a "relationship manager," who is responsible for handling all the customer's business with the bank.

It also has some of the best rates in the nation. VirtualBank offers 6.5% interest on money market accounts, according to Bank Rate Monitor in North Palm Beach, Fla. ■

## UN: Global E-Commerce Challenges Abound

**Governments must help, say delegates**

BY THOMAS HOFFMAN  
UNITED NATIONS

Government bureaucracy, rickety telecommunications infrastructures and a lack of qual-

fied information technology professionals are hindering e-commerce growth around the world, according to a group of delegates who spoke at a United Nations-sponsored IT conference here last week.

Much of the discussion focused on the need for governments to act as agents of change to advance e-commerce within their borders.

### Others Lag Behind

Most underdeveloped nations are woefully behind the digital curve. According to a report issued last year by the UN-based International Telecommunication Union, less than 6% of all Internet users can be found in the developing regions that contain 84% of the world's population.

Developed nations are also struggling to ramp up to get on the information superhighway. Greece, for example, plans to invest \$300 million during the next five years in its e-commerce infrastructure to help it catch up with European Union members such as Finland and Denmark, said George Doukakis, an adviser to the prime minister of Greece.

But the key to success is less about the need for seed money

than it is about cultural overhaul. This includes helping Greece's citizens and government become more internet-literate and less entrenched in the nation's old-style economy, Doukakis said.

Delegates pointed to other countries that are faring better. For example, Mpho Matla, the minister of industry and trade for Lesotho in southern Africa, heaped the shortage of skilled IT workers. "You're maybe asking for [an IT] consultant that's being used by 15 [neighboring] countries, and when you want to use them, they're not available."

In some instances, there's a disconnect between government and the private sector. In India, for example, government involvement in IT issues has hindered private-sector progress in e-commerce, said Ravi Sawhney, director of the International Trade and Industry division at the UN Economic and Social Commission for Asia and the Pacific in Bangkok, Thailand.

In contrast, the Brazilian government appears to be more forward-thinking. The number of Brazilians who file tax returns electronically has

grown from 600 in 1997 to

more than 8 million this year, said Vanda Scartezini, secretary of Brazil's Ministry of Science and Technology.

The U.S. and Western Europe might be "4 or 5 meters ahead in the 100-meter e-commerce race," said Bruno Lavin, head of e-commerce at the UN Conference on Trade and Development. But others said the U.S. government still has a long way to go.

Case in point: Ninety-six percent of transactions conducted by the U.S. government are done manually, said Rosendo G. Parra, senior vice president of manufacturing, worldwide services and public sector, at Dell Computer Corp. in Austin, Texas. ■

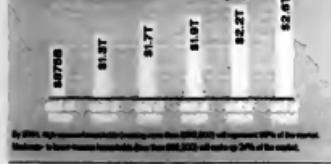
## SNAPSHOT

### Dollars Assets to Triple

More than \$1.5 billion in new assets will move to online banking during the next few years, according to a new report from Frost & Sullivan, Inc., based in Norwell, Mass. Based on Frost & Sullivan Data Corp. (FSDC). This will add to the current growth of the current online account market base, which is already around \$1 billion, the report said.

The growth will trigger competition among online firms that will be an intense — and expensive — as the competition for new accounts in 1998 and last year, according to FSDC analyst Sheri Lusk.

"The will introduce the opportunity for segmentation strategies in marketing, pricing, servicing and even to site design and business models," said Lusk, who works in IDC's Online Financial Services research group.



**DELEGATES** At a United Nations IT conference say governments need to help advance e-commerce



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**Other financial services to businesses and consumers**

with built-in trust and a built-in constituency. And they are developing a physical-presence strategy."

According to Jamieson, this lets VirtualBank address some

issues that have been affecting online banking: awareness, trust and customers' wish for a physical presence.

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## SNAPSHOT



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\$3 million a year  
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adapters  
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and running.



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## BRIEFS

### Microsoft Gets Static In European TV Deal

The European Commission has circulated a draft decision recommending that Microsoft Corp.'s proposed \$3 billion investment in British cable-television concern Telewest Communications PLC be blocked because it threatens competition in the market for digital television technology. Microsoft is seeking a 25.0% stake in the British company, along with joint control of Telewest with AT&T Corp.'s Liberty Media Group. Microsoft is preparing to offer new concessions to gain clearance for the deal. A final decision is expected from the commission this month.

### Buy It, Charge It: UPS to Deliver Credit

Atlanta-based United Parcel Service of America Inc., moving beyond its core package-delivery business, will offer a credit card and an unsecured line of credit for retailers that purchase products on [AmericanExpress.com](http://www.ups.com), the Atlanta-based online concern that sells area rugs and other upscale specialty products. UPS Capital Corp., the financial services arm of UPS, will award the program in the first of a variety of financing deals it expects to make.

### SanDisk to Invest in Israeli Wafer Foundry

Sunnyvale, Calif.-based SanDisk Corp., the world's largest supplier of flash data storage, will invest \$75 million in a three-year, \$15 billion expansion of Tower Semiconductor, a struggling Israeli wafer foundry.

### Government Bids to Stifle Online Gambling

The U.S. House Banking and Financial Services Committee last week sought to cripple online wagering by making it illegal for an Internet gambling business to accept bank instruments like credit cards, debit cards or wire transfers. Bill proponents said they believe the legislation will cause credit-card issuers to deny online wagering transactions, a committee official said.

# Linux Inches Nearer To the Data Center

*Some users push Linux into new roles even though features are still missing*

BY DOMINIQUE DECKMEN

EVEN ARDENT supporters of Linux contend that the open-source operating system isn't quite ready to take on big database loads and mission-critical applications. But that hasn't prevented some users from pushing Linux into roles beyond its niche as an Internet infrastructure platform.

Internet service provider [lisp.com](http://www.lisp.com) Corp. in San Francisco is a typical Linux user, with about 70 Linux servers, but Vice President of Engineering Ric O'Connell also uses Linux to run Oracle8i for the company's online transaction processing (OLTP) database and its data warehouse — thus avoiding the need to support multiple server operating systems.

What allows companies like lisp.com to move to Linux into new areas is the increasing availability of enterprise-class commercial software.

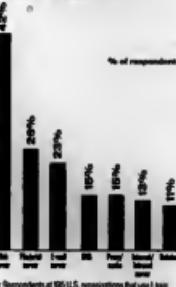
Vendors such as Oracle Corp. and SAP AG are leading the charge. SAP claims that 400 customers are running its enterprise resource planning (ERP) software on Linux.

Most Linux users face the

same bottleneck. "Given the absence of a journaling file system and other technical limitations, Linux at present lacks the maturity to support high-end transaction databases," said Stacy Quinot, an analyst at Giga Information Group Inc. in Santa Clara,

### Linux Server Applications

*The top seven functions of Linux servers installed at U.S. sites in 1999:*



Source: Respondents at 100 U.S. organizations that use Linux.

Several products — open-source and commercial — exist or are under development to add such features to Linux. But many users are waiting until it's clear which of those technologies will be supported in the standard Linux kernel.

Another factor holding back Linux is the hardware. Linux is most popular on commodity Intel-based platforms, which rarely scale beyond four processors and have limited I/O capacity. New servers based on Intel's forthcoming Itanium processor may help address that by year's end.

Those bottlenecks don't prevent smaller companies from moving more of their systems over to Linux. Gene Christian, technical operations manager at office furniture dealer Goldsmith's Inc. in Wichita, Kan., is running Lotus Domino on Linux and is considering moving his company's main application — a vertical system for furniture dealers — to Linux from SCO OpenServer.

### Running Applications

"I see Linux today as a great way to get applications up and running," said Arthur Tyde, founder and executive vice president of LinuxCare Inc., a Linux services company in San Francisco. "When it's time to scale, Linux may be ready — or there's plenty of options, like Solaris."

"There are lots of good, robust Unixes to run your database on," said Mike Prince, vice president and CIO at Burlington Coat Factory Warehouse Corp. in Burlington, N.J., a vocal Linux advocate. "You'd have to ask how it makes sense to push the curve by trying to run Linux in an environment where it's not ready yet." But Prince said he wouldn't hesitate to run an ERP system on Linux.

"We're pushing the limits of Linux in OLTP and data warehousing," acknowledges [lisp.com](http://www.lisp.com)'s O'Connell, who said he may soon be forced to move his growing database onto a proprietary Unix platform. But in the long run, he said, "I am convinced Linux will be an enterprise-class operating system." ■

### SCO Stalls on Launch of Its Own Linux Flavor

For months, the Santa Cruz Operation Inc. (SCO) had been expected to launch its own version of Linux. But last month, the Santa Cruz, Calif.-based company suddenly backed off its initial announcement.

According to John Palmer, SCO's vice president of worldwide marketing, the announcement was stalled when SCO's dealer channel expressed concerns about such questions as what effect selling Linux might have on other product lines.

"We had to drop back 20 yards and are still meeting with partners over the issues," said Palmer.

SCO has long relied on an extensive network of value-added re-

sellers. Palmer said the SCO Linux product — when it finally arrives — will be sold through the same channel.

"The on again, off again strategy is confusing," said Stacy Quinot, an analyst at Giga Information Group Inc. "It's not clear exactly what SCO is committing itself to."

Groups of SCO's marketing counterparts at SCO's continuing to Provo, Montana, a joint effort with IBM Corp. to deliver a 64-bit Unix for Intel Corp.'s Itanium processor, said Quinot. SCO Linux may be little more than a migration strategy for users of SCO's proprietary Unix version, especially its legacy OpenServer product, said Quinot.

But Tony Iams, an analyst at D.H.

Brown Associates Inc. in Port Chester, N.Y., said he believes SCO should be taken seriously by virtue of its long experience selling Unix on Intel platforms.

Other commercial software vendors have shown an inclination to support the Linux distribution. Oracle Corp. recently announced a Japanese joint venture among Oracle Japan, Tokyo-based NEC Corp., and Brasstone, Calif.-based Turbo-Lines Inc. to develop a Linux version optimized for Oracle's dual-Micrel Linux, but executives said they have no plans to release the operating system in the U.S.

— Dominique Deckmen



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# Months Late, PeopleSoft To Release ERP Upgrade

**Analysts say Release 8 should return vendor to big-player status in market**

BY TODD R. WEISS

**A**LMOST a year after unveiling the planned contents of its next-generation enterprise resource planning (ERP) system, PeopleSoft Inc. is finally getting ready to release the software.

The Pleasanton, Calif.-based vendor plans to showcase its soon-to-be-released PeopleSoft 8 suite of ERP applications this week in New York. Due out by the end of the quarter, the software has been a long

time coming. PeopleSoft's original development schedule called for the upgrade to be ready last year.

For users, the successor to the current PeopleSoft 7.5 release is expected to improve the software's ease of use and add tighter Internet integration and a host of other e-commerce features.

And for PeopleSoft, which has been hit by harsh financial times, layoffs and management changes since early last year, the impending release of PeopleSoft 8 is seen as a critical

step in the company's attempt to regain some momentum in the market for ERP and other business applications.

Though the company took its time developing PeopleSoft 8, the new suite should solidify its standing among ERP vendors from a technical standpoint, said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Berkeley, Calif. PeopleSoft 8 doesn't add any market-shattering features but is "going to give them a lot of headway in terms of catching up with the competition," Greenbaum said.

PeopleSoft declined to comment on the planned launch. But the upgrade is expected to transform its flagship software

into a fully Internet-enabled application with a new browser-based user interface that can be linked to back-office ERP systems via Web servers.

That will let end users work through standard Web browsers without having to install the full Windows Client version of PeopleSoft's application on their PCs, according to previous statements by the company. Users will also be able to access the software through PCs, wireless devices and even cellular phones.

Kelli McGonigal, a senior systems developer at PeopleSoft user Green Mountain Coffee Inc., said eliminating the need to install client software on every desktop PC should

Continued from page 1

## E-Signatures

A digital signature links a person's identity to a specially encrypted private key that is issued to only one bearer. The private key can be used to elec-

tronically sign a communication, which can then be opened by someone with a public key.

A certificate authority maintains the public key and also issues and verifies the digital certificates that validate the identity of each party in an Internet transaction.

A slew of vendors, including

VeriSign Inc., Baltimore Technologies Inc., Xcert Inc. and RSA Technologies Inc., supply the core technologies that allow most of this to take place.

The problem is that the technologies are too often proprietary, making it very difficult to certify digital signatures in a PKI where there's a mix of vendor products and certificate authorities involved, said Mahantesh Kothiyal, a vice president at F-credit.com Inc., an online credit verification service in Dedham, Mass.

Each vendor, for instance, has its own certificate issuance, validation and revocation processes. And there are often differences in authentication policies and in the way that private keys are managed from vendor to vendor, users said.

The differences don't really matter in cases where companies are rolling out digital signature systems purely for internal use, said Wayne Aastad, a staff engineer in the advanced information systems group at the Idaho National Engineering and Environmental Laboratory.

"But as soon as you start trying to deal with [multiple] businesses or multiple corporations, then it becomes an issue," he said.

Getting around such prob-

## Steps to Making 'E-Hancks' Valid

The Electronic Signatures in Global and National Commerce Act takes the legal question of who's responsible for transactions off the table and offers businesses the option of whether to accept digital signatures and to choose what kind they will use, said Marcato Halpern, an attorney at Gordon & Gluskin LLC in Chicago. Digital signatures include digital certificates, dual-key encryption and passwords, Halpern said.

In the process of accepting digital signatures, analysts said businesses will have to set up criteria to make these signatures valid when the law takes effect Oct. 1. Those steps include the following:

- Educate consumers that a mouse click is the equivalent of a paper signature.
- Offer consumers the option of revoking their consent at a later date.
- Build storage and retention within the system for agreements to be pulled up later.
- Process e-mail more efficiently, since digital signatures will require more electronic contact with clients.
- Add higher security within each e-mail to clients.

Many companies already use digital certificates, mostly in the form of passwords, analysts said.

Online brokerage DLDirect Inc. in Jersey City, N.J., uses a password system with customers and verifies their information with Equifax Inc., an Atlanta-based credit-verification company that helps clients confirm customer, supplier and partner identities during Internet transactions.

"American business is moving around [more cards] and passwords are more practical," said Michael Logan, a senior vice president at DLDirect.

—Kathleen O'Brien

### AT A GLANCE

#### PeopleSoft's Action Plan

Other steps the company has taken to try to regain its sales momentum include:

September 1999: Craig Conway takes over as PeopleSoft's CEO, replacing founder David Duhfield.

January 2000: PeopleSoft acquires The Vanite Corp., a \$50 million firm, adding CRM software to its product line.

March 2000: PeopleSoft announces plans to set up Internet-based trading exchanges for users.

March 2000: Application hosting services are unveiled for users of PeopleSoft's applications.

reduce the Waterbury, Vt., firm's application deployment and technical support costs.

"What that means for [information technology] departments is that there will be zero client-side maintenance," McGonigal said. Green Mountain Coffee has been beta-testing PeopleSoft 8 and is pleased with its Web integration, she said, adding that the company hopes to upgrade its ERP system to the new suite by early next year.

### Change of Plans

Philadelphia-based Reliance Insurance Group originally wasn't planning to upgrade its PeopleSoft 7.5-based finance system until the next release after PeopleSoft 8, said John Martines, vice president of the insurer's financial systems group. But that strategy was scrapped a month ago after Reliance learned more about the Web-enabled features in the upcoming version, he said.

Martines, who is also president of PeopleSoft's international customer advisory board, said he now hopes to upgrade to PeopleSoft 8 by early next year. The new suite "will allow us to use our data more strategically" and to share information more easily between departments, he said.

David Dohrin, an analyst at Benchmarking Partners Inc. in Cambridge, Mass., said PeopleSoft 8 should bring PeopleSoft's applications up to speed with rival ERP suites that already include Internet capabilities. "This is one of the best products on the market, and it's really odd that [PeopleSoft] can't find customers," he said. ■

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**What Is Windows 2000 Advantage?**

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

**Online This Week****Bluetooth Linking Portables, Cell Phones and Other Devices**

New wireless technology for Compaq portables promises to change the way we work and reduces how networks link people together. At the heart of Compaq's strategy is the Bluetooth personal area network technology, which can wirelessly link portable computers with cellular phones, handheld computers and other devices.

**Compaq, Microsoft team up on Datacenter Solutions Lab**

With the expected introduction of Windows 2000 Datacenter Server only a couple of months away, Compaq demonstrated its commitment to the third Windows 2000 server product with the opening of its Datacenter Solutions Lab. The lab will be staffed by Compaq and Microsoft personnel and based in Bellevue, Wash., only minutes away from the Microsoft campus.

**Microsoft's BizTalk Binds Legacy Apps Via Internet Technology**

If your IT shop maintains multiple computing systems that contain overlapped or duplicate information, help may be on its way in the form of a new initiative from Microsoft called BizTalk. The effort is trying to create a coherent way for enterprises to manipulate a wide variety of data sources and serve as the glue that binds together legacy applications using existing Internet standards.

**Quick Click** Windows 2000 Advantage frequently runs in-depth technical stories by Bob Williams, Mark White and other authors. Do you enjoy these in-depth stories?

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34%

No  
idea

Yes,  
it is

**Microsoft**

# Windows 2000

**► News****CornerDrugstore.com Scales up With ProLiant Servers, Windows 2000**

By Bruce Hoard

CornerDrugstore.com's decision to implement Compaq hardware running Microsoft's Windows 2000 was based on the need for scalability when the 2,000 to 3,000 drug stores it hoped to sign up as partners turned into 3,500, before the company launched. The Windows 2000-based Compaq system at CornerDrugstore.com scaled to meet the unexpected demand. It also stood up to tests that included 25 customers doing their best to crash the Compaq ProLiant servers. They didn't even get close.

CornerDrugstore.com CIO Ken Westby was challenged with spending no more than \$2 million on an infrastructure, which comprises a nationwide network of pharmacies for consumers to purchase products online.

Several factors led to the selection of Compaq ProLiant servers and Windows 2000. Compaq won because it was easy to integrate these technologies, and because the company had proven the scalability of its products.

Westby was impressed with Compaq's Professional Services consultants. "We liked that we could go to one vendor, and their Professional Services would be onsite in two hours or sooner," he says.

The development staff at CornerDrugstore.com had been working on Windows 2000 since its second beta release and were impressed with the robustness and reliability of the operating system.

"We decided to take advantage of the real world results we were seeing with Windows 2000 Professional, and that led us to the choice of the server platform," Westby states.

CornerDrugstore.com is using Active Directory for DNS management. It allows

the company to manage its outsource partners. "Leveraging Windows 2000 and Active Directory has made the manageability of those organizations and users and domains much easier," he declares.

Westby also stresses the usefulness of Windows 2000's mobility features, noting that CornerDrugstore.com has its IT center in Redmond, Wash., offices in Chicago and Manhattan and its 4,000 member pharmacies nationwide. Windows 2000 allows these remote users to perform tasks such as changing their IP settings without having to reboot.

Asked if he believes that Windows 2000 was complex to implement, he replies, "It's probably one of the easiest systems to administer. There are significant time savings compared with Windows NT or Unix-based systems."

Westby maintains the cooperation of Compaq and Microsoft is just as important as the technology.

"We feel we have two partners that work well together, and stay in contact with us," he says. "Both companies have just been exceptional."

For the full text, visit

[www.Windows2000Advantage.com](http://www.Windows2000Advantage.com).

# ADVANTAGE

## Compaq Announcement Stresses Change Management, Simplified Enterprise Computing

By Bruce Hoard

The central theme behind Compaq's recent Despro and Armada announcement is simplifying enterprise computing and enabling customers to better manage change. The combination of Windows 2000 Professional and Compaq's product reliability allows customers to slash total cost of ownership.

In the announcement, Compaq introduced a completely redesigned Despro EN line, new Armada PCs, new projectors and monitors. The new Compaq Despro EN series offers improved manageability, stability and consistency through the life of the product and incorporates the latest Intel processors and new 815E chipset, which was also recently announced by Intel.

Responding to customer input, Compaq is making a single software image and optional standard drivers available for the entire Despro EN series. A pre-installed version of Ahins eXpress, an easy-to-use intelligent manageability software package, is now available. Ahins eXpress is available for use for the Despro EN free of charge for 30 days. Ahins eXpress enables users to take the full image of their current desktop configuration and replicate it across hundreds or thou-

sands of new PCs being deployed with a couple of mouse clicks.

Moreover, the new Despro EN Series comes pre-installed with Windows 2000 Professional across all models, therefore enabling

the new mobile PC models. For example, the operating system's instant-on support allows Despro and Armada PCs to operate on very low power when they are not in use, and then power up quickly when they are needed.

In addition, Windows 2000 also supports the programmable keyboards that allow Despro and Armada users to instantly access their favorite websites by clicking a single key.

"Enterprise customers are looking to Compaq to help them simplify their computing environments," says Mike Pocock, Vice President and General Manager, Customer Marketing, for Compaq's Commercial Personal Computing Group. "The products we are announcing today answer those demands with new chassis designs, common software images across entire product lines and a more robust configuration and order management capability. We are resolute in our commitment to put the customer first as we lead the industry toward simple, powerful enterprise computing products."

Windows 2000 further complements the Armada announcement by offering advanced power management and enhanced Internet access features that empower

customers to realize the multiple benefits of combining a highly reliable and manageable hardware platform with the reliability and manageability features of Windows 2000.

For mobile users, the Compaq Armada M700, M300 and E500 notebooks now combine the latest Intel SpeedStep processors, also newly announced, with common options, common docking solutions and, similarly to the Despro EN series, a common pre-installed image across the entire Armada E and M family. (For the entire press release, please go to <http://www.compaq.com/newsroom>.)

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The Web Magazine for IT Leaders  
Implementing Windows NT and Windows  
2000 with Compaq Services and Solutions



### Compaq, Windows 2000 Driving Supply Chain Applications

By Lori Robak

IT managers are looking for robust solutions for supply chain applications.

Fortunately, Compaq is using the power of Windows 2000 to provide cost-effective, enterprise-wide supply chain solutions.

In the past, the term "supply chain" referred to corporate operations.

Now, thanks to the Internet, this chain has been expanded to include customers, vendors, suppliers and distributors.

While mainframes have the power to supply chain applications, they suffer from a lack of interoperability.

Distributed computing solved that problem, but issues with interoperability, management and enterprise applications inflated the total cost of ownership.

ProLiant 8-way server family combined with Windows 2000 can deliver the performance of a mainframe with better usability and higher cost-effectiveness.

A strong supply chain application depends on a successful storage strategy. Therefore, Compaq's SAN strategy relies on the Enterprise Network Storage Architecture. This architecture allows servers to obtain

storage through a utility gateway, resulting in distributed pools of storage that are readily available.

In addition, Compaq's StorageWorks family offers centralized management capabilities.

Recently Compaq introduced SANworks to help simplify, centralize and automate the management of direct-attached storage, network-attached storage (NAS) and SANs.

Compaq is able to provide solutions that enable companies running Windows 2000 to enhance their supply chain applications because it has a wealth of experience.

[Barnes&Noble.com](http://www.barnesandnoble.com), [Amazon.com](http://www.amazon.com) and [Pennzoil Products Co.](http://www.pennzoil-products.com) are just some of the companies for which Compaq has built and implemented Windows NT-based value chains.

Combining the robustness of Windows 2000 with the features of Compaq's servers, open storage and Unix interoperability, IT managers can really "power up" their supply chain applications.

For the full text, visit [www.Windows2000Advantage.com](http://www.Windows2000Advantage.com).

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GO

# FTC Keeps an Eye on B-to-B Online Markets

**Antitrust experts advise exchanges to keep access open, prices secret**

BY MITCH BETTS  
WASHINGTON

**T**HIS FEDERAL Trade Commission made it clear last month that it's still learning about business-to-business e-commerce exchanges — and that it's in no hurry to regulate the fledgling online markets.

But during a two-day workshop on exchanges, FTC officials and legal experts also made it clear that the exchanges will run afoul of antitrust law if they become industry cartels.

"The promise of huge efficiencies [from business-to-business exchanges] is certainly tantalizing. On the other hand, I can't help but wonder if there might be a serpent in the garden of efficiencies," namely anticompetitive activity like price signaling, collusion and freezing out competitors, said

FTC Commissioner Sheila F. Anthony. The FTC has opened an inquiry into the auto industry's Covisint supply-chain venture, and other federal agencies are investigating the airline industry's Orbitz ticket exchange. No antitrust charges have yet been filed.

Legal experts at the FTC workshop said the keys to avoiding antitrust problems are making sure access to the Web exchange is open and keeping the prices and trade secrets of all participants confidential. They said exchanges should have firewalls to keep competitors from learning one another's prices in electronic catalogs, bids and auctions.

Metalsite LP in Pittsburgh, a metals market formed nearly two years ago, already has extensive controls and audits that are intended to keep it out of trouble. Plus, every employ-

ee must sign an agreement and take an antitrust class, said Patrick B. Stewart, president and CEO.

Burk Stewart said he's worried that new exchanges are "forming so quickly that they're blowing by the basics of running a business."

Lawyers counseling the new exchanges said founders are



THE FTC's Sheila F. Anthony says

**B-to-B markets deserve scrutiny**

usually aware at the outset of the need to avoid antitrust problems. But when salespeople start discussing how prices will be displayed on the Web, "collusion is certainly possible" unless counsel intervenes, said Joel M. Mittnick, a partner at law firm Brown & Wood LLP in New York.

As a general rule, information sharing among rival suppliers is a red flag for antitrust enforcers if the information involves prices, costs or strategic plans. One concern is price signaling, by which competitors display the price increases or discounts they plan to make in an attempt to get other industry players to go along.

For example, in the 1993 case of U.S. v. Airline Tariff Publishing Co., the government charged that airlines were signaling future price increases and punishing discounters — via an online database. The defendant airlines agreed to a consent decree that prohibited price signaling.

Another way to stay out of antitrust lawsuits is to identify which industry players will be hurt by the exchange and then to minimize that injury, said Roxann E. Henry, a partner at Howrey Simon Arnold & Wafer LLP in Washington.

As FTC Commissioner Thomas B. Leahy put it, business-to-business exchanges will create winners and losers, and "when there are losers out there, there will be litigation." The FTC should also be concerned about whether the inevitable shakeout and mergers of business-to-business exchanges will result in just one exchange in each vertical in-

## AT A GLANCE

### Red Flags

Experts say B-to-B exchanges will run into antitrust trouble if they do any of the following:

- Form a cartel to fix prices or allocate markets
- Allow competitors to see one another's prices in an electronic catalog, bid or auction

- Allow competitors to signal future price increases or discounts

- Allow restrict who can join the exchange, or prevent members from participating in other exchanges

- Allow competitors to discuss their prices, outputs, costs or strategic planning

dustry, said Steven C. Salop, professor of economics and law at the Georgetown University Law Center in Washington. "Once one gets a monopoly, that monopoly will be very hard to dislodge."

FTC officials hinted that they would like competition among multiple exchanges in each industry, with participants free to switch among them. "The key will be [interoperability] standards so that customers can communicate with multiple exchanges," said Tim Stojka, chairman of OIC of Commerce Inc. in Chicago, which runs industrial exchanges. ■

## Airlines Back a Second Online Ticketing Venture

**Hotwire.com will let users reject prices**

BY MICHAEL MEEHAN

A new competitor plans to join the online air wars this September, looking to use the Internet to sell seats on underbooked flights at sizable discounts. The online effort, Hotwire.com, boasts six major airlines as investors and plans to mimic the buyer-driven pricing model made popular by Priceline.com Inc.

Unlike Priceline, however, San Francisco-based Hotwire will allow consumers to window-shop for tickets offered at fixed prices that they can either accept or reject, company

officials said. Priceline requires customers to buy a ticket if the service finds one within the pricing and travel parameters they have entered into its system.

Hotwire was founded by the Tetas Pacific Group, a Fort Worth, Texas, investment company headed by former Continental Airlines Inc. executive David Bonderman. United Airlines Inc., Continental, American Airlines Inc., Northwest Airlines Inc., US Airways Group Inc. and America West Airlines Inc. have joined in as investors, according to Hotwire officials.

But Gregg Brockway, Hotwire's head of corporate development, said the airlines will hold only nonvoting shares. In addition, he said, the airlines won't have seats on the company's board of directors.

Whether the limited role the airlines play in Hotwire's business will be enough to avoid federal scrutiny remains to be seen, analysts say.

Orbitz, another airline-funded venture that plans to launch a more mainstream online ticketing Web site in the next few months, is being investigated for possible antitrust infractions by the Department of Justice and the Senate Commerce Committee. But unlike with Hotwire, the nation's five biggest airlines are the controlling partners in Orbitz.

Hotwire will let different airlines bid for customers through blind auctions, and industry watchers said it has picked what should be a ripe market space.

"It makes sense for the airlines to join in [and try to directly sell unused seats]," said Jeffrey Osborn, an indepen-



OREG BROCKWAY says Hotwire will be independent of airlines

dent airline consultant in Peachtree City, Ga. "These are their seats, and they must be saying, 'Why should we have Priceline do for us what we can do for ourselves?'"

According to PhoCusWright Inc., an online travel research firm in Sherman, Conn., airline bookings via the Internet last year, giving it 10% of the total online ticketing market. But PhoCusWright analyst Lorraine Sileo said she thinks Hotwire will force Priceline to revamp the way it does business. ■

"Hotwire's taking the gambling element out of it [for travelers]," Sileo said. "You have nothing to lose if you seek a fare." But the online travel market should grow large enough to support both companies, she added.

While Hotwire will initially aim at leisure travelers with flexible schedules, it also could influence the business community — but not in a way that will make companies happy. Unlike the airlines, business travelers enjoy sparsely populated flights, said Kevin Mitchell, chairman of the Lafayette Hill, Pa.-based Business Travel Coalition. The group lobbies airlines and other travel-industry participants on issues that affect business travelers.

"It's the introduction of yet another channel to an already saturated customer service model," Mitchell said. "Now you're going to have that many more people on your flight and less space." ■

## Nike Web Hijacking Sparks Finger-Pointing

Company trades blame with NSI and host

BY ANN HARRISON

The hijacking of Nike Inc.'s Web site last month has sparked an international argument over whether the footwear company or Internet domain-name registrar Network Solutions Inc. (NSID) should bear responsibility for the temporary theft of [www.nike.com](http://www.nike.com).

On June 21, a group calling itself S-II redirected traffic from [www.nike.com](http://www.nike.com) to servers at a Web hosting company in a slap at both Nike and the World Economic Forum. Now, the hosting firm is threatening legal action against Nike.

Greg Lloyd Smith, director of FirstNet Online (Management) Ltd. in Edinburgh, said the wayward Nike traffic swamped his company's Web servers and impaired service to its real customers. After unsuccessfully trying to tell Nike for use of his company's servers, Smith said he's preparing to sue the Beaverton, Ore.-based company for neglecting to secure its Internet domain.

### Blame-Shifting

Nike, in turn, said responsibility lies with NSI in Herndon, Va. Changes to the status of Nike's domain name are supposed to be made only via NSI's security system, said Nike spokesman Corby Casler. But NSI allowed S-II's spoofed e-mail to change Nike's registry without requiring a password, she claimed.

Casler added that Nike has locked down any further changes to its registration information at NSI. Nike is also working with the FBI and local police in Oregon "to see exactly what happened and who is liable," she said.

Smith disputed the claim by Nike that it had access to the Crypt-PW encryption system through NSI, and he charged that the footwear maker subscribed to a level of security that lets changes to its information be made from an approved e-mail address. "A responsible company would not deny the fact that their domain was stolen because they did not have satisfactory security in place," Smith said via e-mail.

However, Casler insisted that Smith's claims are inaccurate and said Nike doesn't consider itself liable for the unintended usage of FirstNet's Web servers. Smith "did try to bill us for it, and our response is we are both victims and the real problem is [with] whoever it was who hacked into the system," Casler said.

Smith got into a legal battle with Amazon.com Inc. last year after the company won an injunction against him for using the Amazon.com domain name in Greece in an alleged attempt to coerce a partnership. But Smith rejected any suggestion of



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complicity against Nike. "Our involvement was as an injured party," he said.

NSI, which declined to comment on the circumstances surrounding the Nike domain theft, has been criticized for similar thefts, including the theft of 1,300 domains from New York-based Internet.com in May. Alan Meckler, char-

man and CEO of Internet.com, said NSI told his company that its information had been changed by forged documents sent via fax.

NSI officials "deny that it's their fault," Meckler said. "But the fact is that if you pay [NSI], you are presuming that in the morning the last thing you have to worry about is whether your own domains."

But Connie Ellerbach, a partner at Fenwick and West, a law firm in Palo Alto, Calif., said case law indicates that NSI wouldn't be liable for the theft because it's merely a conduit for domains and takes no responsibility for their validity or for changes in domain-name registrations. A recent decision by the court brought against NSI by Selcom was settled in favor of the registrant, she said.

Ellerbach added, though,

**The Blame Game**  
Who should bear responsibility for the temporary hijacking of [www.nike.com](http://www.nike.com)?

Nike says the responsibility lies with Internet Solutions Inc. because it's the provider of e-mail from the S-II group to do something like hijack Nike's registry without requiring a password.

Network Solutions says it's the fault because the registrant didn't follow proper security practices.

that it would also be difficult for FirstNet to prove that Nike was negligent. "How is Nike going to police registration of a domain and keep them from spoofing or fooling NSI?"

## Microsoft Loses Its SQL Bragging Rights

Benchmark for SQL Server to be redone

BY DOMINIQUE DECIMINI

Microsoft Corp.'s SQL Server 2000 database, which is set to ship within a month, suffered a double embarrassment last week. Record TPC-C benchmark numbers that Microsoft had touted for five months were scratched from the record books after the Transaction Processing Council (TPC) found the results "non-compliant." And IBM published numbers twice as high as Microsoft's with its own DB2 database.

At the launch of Windows 2000 in February, Microsoft Chairman and Chief Software Architect Bill Gates crowed about the numbers, which showed SQL Server 2000 and Windows 2000 processing 227,079.15 transactions per minute (TPM-C), the highest ever measured. The benchmark, which beat high-end RISC servers from IBM and Sun Microsystems Inc., was achieved with 12 Compaq Computer Corp. ProLiant 8500 servers.

The TPC-C numbers figured highly in recent presentations by Microsoft executives.

But at a meeting of the TPC on June 29, the benchmark "was found noncompliant to our policies," said TPC Chairman Jerryold Buggert. "Given the nature of the problem, the tests need to be redone."

The benchmark hit by Compaq and Microsoft was challenged because the tested configuration didn't allow for the primary key of a distributed database to be updated. The TPC wouldn't identify the challenger, citing the confidentiality of the challenge procedure.

An Oracle Corp. spokeswoman refused to confirm or deny that the company was the source of the challenge, saying Oracle doesn't comment on TPC proceedings. The challenge briefly piqued Oracle on top.

Steve Murchie, group product manager for SQL Server at Microsoft, said the TPC's rules are ambiguous on the issue. He claimed that earlier benchmarks by Oracle and Compaq's Tandem Computers Inc. and in Cupertino, Calif., have also failed to implement primary key updateability.

According to Murchie, Microsoft has modified the SQL

Server 2000 code to implement the required feature, so it will be included when the product ships.

Microsoft downplayed the effect that the missing feature had on performance. Microsoft will rerun the tests with the updated SQL Server 2000 code and publish a new benchmark within about a month, he said.

It isn't unprecedented for benchmarks to result in being nullified in this manner, said Jonathan Eunice, an analyst at Illuminata Inc. in Nashua, N.H. "You are policed by your competition," Eunice said.

The SQL Server-on-Windows 2000 benchmark would have lost its first-place ranking last week anyway, with IBM's publication of a record 440,879 TPM-C result for DB2 running on its Netfinity server.

The IBM benchmark does return Win 2k to the top of the TPC ranking since it was run using Windows 2000 Advanced Server.

Eunice said TPM-C benchmarks for clusters aren't the most important numbers when compared to symmetrical multiprocessing (SMP). "From a manageability perspective, people don't run a 16-way cluster if they can get a single SMP server [with the same performance]," he said. ♦

SYSTEM	TPC-C	TPC-E	TPC-H	TPC-D	TPC-B	TPC-A
Microsoft	440,879	\$32.26	IBM DB2 UDB 7.1	Microsoft SQL Server 2000	July 3, 2000	
RISC System 6000 Enterprise Server 850	135,815	\$52.70	Oracle8i Version 8.1.6	IBM DB2 4.3.3	Oct. 29, 1999	
Excale EPC 2400 cht	135,815	\$54.94	Oracle8i Version 8.1.6	IBM DB2 4.3.3	Nov. 5, 1999	
Sun Enterprise 6500 Cluster	135,461	\$67.10	Oracle8i Enterprise Edition Version 8.1.6	Sun Solaris 2.6	Sept. 24, 1999	
Steriba Enterprise 10000	15,395	\$48.63	Oracle8i Version 8.1.5	Sun Solaris 7	March 24, 1999	



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## The Blame Game

**Who should bear responsibility for the temporary theft of www.nike.com?**

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### Benchmark for SQL Server to be redone

BY DOMINIQUE DICKMANN

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## Database Benchmarks

IBM is the current king of the database hill.

IBM	Netfinity 8500R c/s	440,979	\$32.28	IBM DB2 V8.71	Microsoft Win 2000	July 3, 2000
IBM	RISC System 6000 Enterprise Server 580	135,815	\$52.70	Oracle8i Version 8.1.6	IBM AIX 4.3.3	Oct. 29, 1999
Bull	Escale EPC 2400 c/s	135,815	\$54.94	Oracle8i Version 8.1.6	IBM AIX 4.3.3	Nov. 5, 1999
Sun	Enterprise 6500 Cluster	135,461	\$97.10	Oracle8i Ent Edition 8.16.0	Sun Solaris 2.6	Sept. 24, 1999
Sun	Starfire Enterprise 10000	115,395	\$105.63	Oracle8i Version 8.1.5	Sun Solaris 7	March 24, 1999

Server 2000 code to implement the required feature, so it will be included when the product ships.

Murchie downplayed the effect that the missing feature had on performance. Microsoft will rerun the tests with the updated SQL Server 2000 code and publish a new benchmark in about a month, he said.

It isn't unprecedented for benchmarks results to be nullified in this manner, said Jonathan Tuncic, an analyst at Illuminata Inc. in Nashua, N.H. "You are policed by your competitors," Tuncic said.

The SQL Server-on-Windows 2000 benchmark would have lost its first-place ranking last week anyway, with IBM's publication of a record 440,679 TPM-C result for DB2 running on its Netfinity servers.

The IBM benchmark does return Win 2k to the top of the TPC ranking, since it was run using Windows 2000 Advanced Server.

Tuncic said TPC-C benchmarks for clusters aren't the most important numbers when compared to symmetrical multiprocessor (SMP). "From a manageability perspective, people don't run a 16-way cluster if they can get a single SMP server [with the same performance]," he said. ■



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## Financiers Aim to Unify XML Standards

BY MARIA TROMBLY

A new financial services industry group is trying to weed through two dozen existing

XML-based financial standards to come up with one universal lexicon.

The XML ISO 15022 Com-

mittee Advisory Group was established June 20. It was created to map conflicts among the existing lexicons and to make a

recommendation to the International Organization for Standardization in Geneva by year's end.

"It's a big list," said John Goeller, director of electronic trading at Salomon Smith Barney Holdings Inc. in New York

and the committee's chairman.

Goeller said the emerging XML standards fall into two categories — those that cover transactions such as stock purchases and those that help in the research of companies.

For example, Open Financial Exchange (OFX) lets financial institutions communicate with customers about online banking, bill presentation and payment and investments.

On the research side, Financial Business Reporting Language standardizes the way companies publish financial reports, which could make it easier for analysts or investors to compare profits and losses of publicly traded companies.

Although these standards are based on XML and overlap when it comes to content, they address different concerns, are backed by different groups and cover different types of data. In addition, old standards like OFX are being converted to XML.

Standards also differ based on their origins, according to Dushyant Shahrawat, an analyst at Needham, Mass.-based TowerGroup. The ones most likely to survive are backed by industry groups, he said.

Financial Information Exchange Markup Language, for example, is being developed by the Technical Committee of U.K.-based FIX Protocol Ltd., a consortium of more than 20 financial firms.

Other standards are backed by smaller groups. Financial XML, for example, was released by Integral Corp. in Palo Alto, Calif., and is backed by Sun Microsystems Inc. and Chase Manhattan Corp. in New York. ♦

## AT A GLANCE

### Too Many Languages

*Financial standards that conflict include the following:*

**FaxML:** Financial Information Exchange Markup Language; focuses on institutions

**FpML:** Financial products Markup Language; enables e-commerce activities in the field of financial derivatives

**FaxXML:** Financial XML; standard data interchange language for capital markets

**EBSML:** Extensible Business Reporting Language; for the preparation and exchange of electronic reports and data

**ebsXML:** Electronic business Extensible Markup Language backed by the United Nations body for Trade Facilitation and Electronic Business

**BRIEFS****Informix Issues Q2 Profit Warning**

Menlo Park, Calif.-based database and tools company Informix Corp. issued a profit warning last week, predicting net income for the second quarter of 1 to 3 cents per share on revenue between \$240 million and \$250 million, well below analysts' expectations. The warning came after two successive quarters in which the company outperformed analysts' expectations. There has been no revenue growth in any region, the company said in a statement, blaming poor results in Europe on the strength of the U.S. dollar. Final results for the most recent quarter, which ended June 30, are expected next week.

**Micrografx Lays Off 40% of Staff**

Austin, Texas-based business graphics software vendor Micrografx Inc. last week announced that it had laid off 74 of its 187 employees, primarily in the U.S., as part of an ongoing global restructuring effort aimed at restoring profitability at the financially troubled company.

The layoffs will result in lower operating costs and were designed to offset substantially weak international sales in the first fiscal quarter. However, Micrografx said in a statement that it expects other changes to its business operations to result in charges that will be included in the results for its fourth fiscal quarter, which it plans to announce in mid-August. The company didn't disclose the size of the charges it expects to report.

**IBM's New Alliances To Boost Revenue**

IBM last week announced new alliances with five application developers that company officials said will bolster revenue by \$1 billion in the next three years. The company will partner with firms in Sweden, Ireland, Australia and the U.S. Under the agreements, the new partners will commit to IBM's server platforms, middleware and services, while Big Blue will assist them with the selling and marketing of their products as part of IBM's PartnerWorld for Developers initiative.

**Oracle Faced With Loss of President**

*Ray Lane to remain on firm's board of directors after surprise resignation*

BY JENNIFER DISABATINO

**O**RACLE CORP. lost its second-in-command last week when President and Chief Operating Officer Ray Lane resigned. The high-profile executive will retain his position on the board of directors, however, the company said.

Oracle confirmed Lane's departure in a brief press statement but didn't cite a reason for his resignation. Lane wasn't available for comment.

Lane, 53, joined Oracle as its chief operating officer eight years ago and was named president in 1996.

Oracle CEO Larry Ellison will temporarily assume Lane's responsibilities, according to Oracle spokeswoman Jennifer

Glass. "The company hasn't yet named its successor," she said.

Chris Shilakies, an analyst at Merrill Lynch & Co. in New York, said Senior Executive George Roberts and Executive Vice President Gary Bloom are likely candidates.

"This could place near-term pressure on Oracle, as Lane had held senior positions at Oracle for the past eight years and was highly regarded," by Wall Street, Shilakies said.

"I think Ray Lane was even more of a guiding force at Oracle than the general public gave him credit for. He will be sorely missed," said Mike Prince, CEO at Burlington



LANE has been No. 2 for the past eight years

new WebSphere if the migration process were too complex.

Now, "you have to talk to a database with an EJB, and you have to create that interaction in VisualAge [IBM's application development tool] and then transport it to WebSphere," said Guyette. "But I want to minimize any change-over. If they come up with bundled solutions, it would help, but we still have to have more work."

According to Cambridge, Mass.-based Giga Information Group Inc., IBM trails San Jose-based BEA Systems Inc.

**IBM to Turn WebSphere Into Java Middleware Platform**

*Hopes to gain on BEA in the EJB server market*

BY LISA COPELAND

IBM wants to transform its WebSphere application server into an infrastructure platform and double its share of the Java application market. But analysts and users said last week that IBM still has some work ahead of it.

As part of its newly unveiled strategy, IBM will embark on a yearlong, \$1 billion development and marketing project to convert WebSphere into an Enterprise JavaBean (EJB) middleware platform from which customers can more easily run prebuilt Java applications.

At PC Expo late last month, IBM released WebSphere Application Server 3.5 and an-

nounced two applications that run on top of it: WebSphere Portal Server and WebSphere Personalization Server.

Nick Gall, an analyst at Meta Group Inc. in Stamford, Conn., said bringing applications together under one WebSphere sense.

"Yesterday, WebSphere was just a JavaBean server with raw programming power; you could build a lot with it, but it had no prebuilt functionality for portals, tracking or shopping carts," Gall said. "Now, they're doing hardware engineering to rewrite [WebSphere] to run on top of a Java platform, but they still have their work cut out for them."

Tony Guyette, a senior systems analyst at the Federal Reserve Bank of Minneapolis, said IBM's WebSphere currently requires a lot of custom coding to add new capabilities, but he would avoid moving to the

Covisint with the Big Three automakers."

In November, Lane told Computerworld Hong Kong that he had received an offer to take over as CEO at Hewlett-Packard Co. and that he had been in talks with Compaq Computer Corp., though he said he received no firm offer from Compaq.

There have long been open disagreements about business strategy between Lane and Ellison. In the same November interview, Lane said he saw problems with Ellison's new business-unit accountability model.

That model forces each part of the organization within Oracle — development, sales and consulting — to be totally accountable for what it delivers, even though other departments may have a large impact on a particular product or service.

In a statement released last week, Ellison thanked Lane for his work at the company. ▀

Dominique Deckmyn and IDG News Service correspondent James Niccolai contributed to this report.

	2000 FORECAST	1999 MARKET SHARE
IBM	24%	10%
BEA Systems Inc.	24%	32%
Oracle Corp.	3%	5%
Sun-Netscape Alliance's iPlanet	9%	6%
Sybase Inc.	7%	10%

PATRICIA KEEFE

# People in glass houses

**W**HAT A VIRTUOUS GUY, that Larry Ellison. First, the leading provider of databases does his civic duty by pointing out the errors of Microsoft's anti-competitive ways. Then, while still on a public-service high, the billionaire founder of Oracle

cracked open his wallet to fund a year of espionage in a bid to unmask the "underhanded attempts" of supposedly independent groups lobbying in defense of Microsoft.

Of course, we never would have figured out otherwise that Microsoft was linked to these groups. Do you suppose this makes Larry a modern-day Paul Revere? "The Microsoft dollars are coming! The Microsoft dollars are coming!"

Though corporate espionage is nothing new, sifting through other people's trash isn't illegal and Microsoft is no saint, it's tricky playing holier than thou. It's that "let he who is without sin cast the first stone" kind of thing that always comes back and whacks the stone thrower upside the head. And judging from the field day the press seems to be having, Larry must have a heck of a headache.

He should. It probably hasn't occurred to Ellison that you can't whine about a competitor wanting to kill your company and then defend your own sleazy actions on the



PATRICIA KEEFE is Computerworld's editorial director. Contact her at patricia\_keefe@computerworld.com

grounds that "our job is to hurt Microsoft."

You can't complain that Microsoft plays hardball and then shrug off the "unsavory" actions of a hired contractor in your employ.

You can't take umbrage at Microsoft's attempts to influence opinion when you've spent considerable time and energy painting Microsoft as a monopolist to the public and the government.

And those lobbyist groups Larry was so intent on exposing? They were spitting in the wind from Day 1. It became quickly obvious that Judge Jackson was unpersuaded by Microsoft's defense.

To cap off the whole affair, in typical schoolboy fashion, Larry notes that he didn't go through Gates' trash. So I guess this means he's neither a bad guy nor a crook?

In light of Larry's unrepentant view that he was only doing his civic duty, I suppose Microsoft ought to do its part and flush out the pro-antitrust groups that lobbied for its breakup. Now who do you suppose could have been funding them? ♦



DAN GILLMOR

## Foe? Partner? No big deal; it's just business

**T**HE SPECTACLE OF capitalism's creative destruction, as the late economist Joseph Schumpeter described it so well, is never more visible than in the technology industry. Silicon Valley and its counterpart regions around the globe throb with an energy almost unprecedented in human history, and the people who run those companies rise and fall — and often rise again — in a dizzying, semiviolent merry-go-round.

Amid that swelling and ebbing of fortunes is another of the industry's most remarkable qualities — that is, the combination of competition and cooperation that has been dubbed "co-operation," where a company can simultaneously be your ally and adversary.

This came to mind last month when I visited the Microsoft campus for the company's announcement of Microsoft.Net, the company's fundamental shift in strategy from the era of Windows to the era of the Internet. The Net is the computing platform of the future, Microsoft said accurately, though it was less persuasive in the details of how it plans to get from here to there.

As with all such announcements, Microsoft touted its partners in the new regime. There were the usual suspects, but one stood out for its seeming incongruity. A company called Loudcloud, a rapidly rising Internet infrastructure start-up, was on the team. And who is co-founder and chairman of Loudcloud? Marc Andreessen, the co-founder of Netscape, which Microsoft so thoroughly destroyed in its first Internet jihad.

Unlike some other vanquished Microsoft foes, Andreessen wasn't paraded live before the large audience of reporters and analysts. He and/or Microsoft had enough sense to realize what a spectacle that would have been. Maybe this was a sign of Microsoft's moving toward maturity, an adolescent bully discovering that adulthood is more fun.

I visited Andreessen at the Loudcloud offices the following week and noted the irony of his new alliance with his former tormentor. With a smile, he recited a line from *The Godfather*. It wasn't personal, he said. It's just business. Loudcloud is a natural ally in the new Microsoft vision of computing. Bygones are bygones, or something like that.



DAN GILLMOR is a technology columnist at the San Jose Mercury News. Contact him at daniel.gillmor@mercurynews.com

Andressen did acknowledge some satisfaction in the outcome of Microsoft's antitrust trial — largely, he said, because the world discovered the kind of tactics Microsoft had used in going after Netscape. But that was then, and this is now.

I can't decide if this is a healthy attitude or something less noble. Maybe it's a little of each. Maybe it's internal co-operation.

Whatever it is, it's a tech-business trademark. Other values from this industry have been leaking out into the rest of the world. No one should be surprised, as convergence and turmoil arrive on all our doorsteps in the coming years, if this one does, too. ♦

ALLAN E. ALTER

## Leadership today is all about 'we,' not about 'me'

MANY EXECUTIVES could learn a lot about leadership from IT executives, judging by the message I'm hearing from the top leadership experts.

IT leadership per se wasn't on the agenda for a leadership development conference I recently attended. And of course, leadership styles vary enough to make generalization dangerous, and many appointed "leaders" are anything but. But after hearing from bona fide leaders like retired General Colin Powell; Dee Hock, the founder of the Visa International Inc. credit-card network; and many prominent academics and executive coaches, I can say this: IT leadership thinking and practice is in sync with where 21st-century leadership is heading.

Most IT leaders and leadership developers have a realistic, somewhat modest sense of what IT leadership is about. It includes providing both visionary, strategic guidance and basic operational support; achieving credibility by delivering reliable systems on time and on budget; successfully retaining and bringing out the best qualities from technology professionals who can usually find other jobs; and inspiring others through the organization's mission and work. You won't last long as an IT leader if you have a runaway ego — unlike some high-tech and dot-com CEOs, who sometimes manage to act like egotistical jerks for years.

This kind of ego-in-check leadership was the

sort praised by the speakers I heard at the Linkage Inc. conference.

Let's start with Powell. To him, leadership means getting something done that touches people: First and foremost, it's accomplishing a mission that connects personally with the people you lead. As he put it, "An organization needs a sense of purpose, or there is no joy." Second, leadership means "take care of your troops" — people, not plans, get things done. This is one aspect of leadership where many IT organizations can improve — think of the "death march" projects that are a way of life in IT. A leader needs trusted confidants outside the organization who will tell you when you're being a jerk. None of this, you'll notice, involves self-aggrandizement — it's about thinking about the mission, your people and putting limits on your ego.

Coaching is considered an important part of being an effective leader. So it was interesting to hear Marshall Goldsmith, co-editor of *Coaching for Leadership: How the World's Greatest Coaches Help Leaders Learn* (Jossey-Bass, 2000), describe his own technique for coaching executives. After flatly stating that nobody can successfully coach

people who don't want to improve, he laid out a coaching method that minimizes ego — both the executive's and the coach's. Forget about giving advice or criticism. Instead, gather and provide feedback from the executive's peers. Help the executive analyze the feedback and come up with an action plan. Get everyone involved to work in a nonjudgmental way. As Goldsmith told his audience of leadership-development managers and trainers, "The key to the process is to let go, as a coach, of our own ego. They won't get better because of us."

But it was Hock, whose Visa network — a community of financial institutions — resembles an early version of today's virtual organizations, who expressed this kind of ego-centric leadership most directly: "Are you willing to be led by subordinates? If you don't know this, all you know is tyranny. . . . Where behavior is compelled, it's tyranny. Where behavior is induced, it's leadership."

Today, when IT professionals can almost always find other jobs, they can't get away with being overbearing. Many CEOs have yet to learn this; many CIOs and IT leaders already have. ♦

## READERS' LETTERS

### Opinions split on court's decision

IT'S AMAZING what the Internet has done for children's rights. A child under the age of 18, by law, may not buy pornography, purchase a ticket for an R- or X-rated movie, buy alcohol or enter into any contracts. But thanks to the Internet, children may go online and legally do every one of these things! ("Online Child Protection Law Is Unconstitutional, Appeals Court Rules," Computerworld Online, June 23). If our courts are going to continually say that is unconstitutional, then we are violating the rights of free speech by not allowing children to do this in person at any store, movie theater or place of business.

Paul Kirchner  
MS&T Data Services  
Mwayware  
pkirchner@cdar.net

THE DAY they censor the Internet is the day the Internet dies. Freedom is what opens up communication

and free expression to bring countries and people closer together.  
**Karen Stuber**  
Birmingham, Ala.

Readers aren't singing C#s praises

C# IS another example of the arrogance of Microsoft ("Microsoft Users Unconvinced," Page One, June 26), which couldn't possibly accept a network communications model proposed by others to accommodate COM to Unix connectivity. Existing cross-platform initiatives required enormous effort and investment to build the COM bridges. It would be a much better use of IT industry resources if Microsoft would put a few hundred of its developers to work on standards-based communications models. For example, why not just improve the functionality and guarantee the viability of CORBA?

John Wilcox  
Akron, Ohio

C# IS pronounced "C-sharp"? How about "C-pound," since it's yet another Microsoft effort to pound the C language into submission — from a language that is gnarly, large, slow and unreliable.  
**James Nickison**  
West Chesterfield, N.H.

Let's not worry about someone escaping tax

ILL LABERIS IS half-right — his contention that Internet commerce ought not to be taxed differently than other commerce is correct.

But if you compare Internet commerce to the most closely related legacy business, namely mail order, the differences in taxation are not so pronounced. The model under discussion is not so much the Internet as it is business conducted across state lines.

If your supplier has a presence in your state,

you're going to be charged sales tax regardless of how you ordered, or whether delivery is in person or via UPS.

Instead of worrying that somebody's not getting taxed as much as somebody else, let's cheer for the somebody who has escaped a tax. Then, if we want to be fair, let's work to remove some taxes from those already burdened.

Does anybody really believe imposition of new taxes on Walmart-commerce shoppers is going to reduce taxes on Wal-Mart shoppers? Have you ever seen it happen before?

**Larry Brundell**  
Allen, Texas  
brundell@acm.org

More Letters, page 29

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Echle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-0483. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.



ALLAN E. ALTER, a former Computerworld editor in chief at MIT's Sloan Management Review, Contact him at [alter@mit.edu](mailto:alter@mit.edu).

DAVID FOOTE

## Beware recruiters in sheep's clothing

**R**ECRUITING AND psychotherapy are fascinating — and somewhat similar — professions. As a client, you share intimate information with a



DAVID FOOTE is managing partner and research director at Foote Partners LLC, an executive recruitment and advisory firm in New Canaan, Conn. Contact him at [df@footepartners.com](mailto:df@footepartners.com).

relative stranger, who pledges to help you handle what is often a difficult, delicate situation. There's almost always a bit of desperation — and a sense of relief when things go well.

But unlike the therapy industry, recruiting is unregulated — and more susceptible to questionable ethics and business practices. The most stingy criticism is aimed at contingency search firms (those that are paid only when they produce) rather than retained search firms, which earn revenue up front regardless of success and customarily form close bonds with their clients.

Some of the worst abuses are in today's frenetically competitive IT employment market. Most disturbing are stories I've heard from recruiters about "shadow" recruiting companies partnering with other recruitment firms. These shadow firms use inside knowledge about established accounts of principal recruiters to steal workers from the very companies their partners serve so loyally (presumably, they secretly split the profits). If true, these are surely isolated instances.

More common is, for example, going after software developers (even entire departments) who leave their former employers with disks in their pockets that contain a code that eventually shows up in a competitor's new product line.

These are the bad apples. The vast majority of search firms are aboveboard. But these examples highlight the fact that employers must be extremely vigilant about working with recruiters and must stop committing stupid mistakes that can expose them to unscrupulous acts. Mistakes such as:

- Publishing employee biographies, telephone numbers or e-mail addresses on the corporate Web site or intranet.
- Issuing press releases touting successes of employees by name, title and other information.
- Producing company telephone directories that list employees by function and title and provide full contact information.
- Boasting to reporters about company achievements and naming names.
- Offering unsolicited, unnecessary inside information to recruiters.

■ Failing to educate naive help desk and security personnel, who may innocently divulge sensitive employment-related information.

Researchers take courses nowadays on how to get around firewalls, so don't think you can hide anything posted on internal or external Web sites. And do you know that if a recruiting firm can't get a corporate employee directory from a disgruntled ex-staffer, it can probably buy one from the "gray" market for \$500 to \$750? Or that many contingency recruiters are constantly amazed at how much detail about a company — e.g., organizational charts, staffing plans — their clients willingly volunteer at the beginning of the relationship without so much as a request?

I recently polled some respectable search firms for additional advice on what employers should do to protect themselves. If you follow the advice in this list, you can save yourself therapy bills when your turnover surpasses 30%.

- Use a variety of recruiters and insist that they sign strict "hands-off" agreements.
- Spend time with search firms you fear, making them feel they can get your business if they don't anger you.
- Mask the e-mail addresses of your most valuable employees so they are indistinguishable to outsiders.
- Work with firms that abide by the standards of industry groups such as the National Organization of Retained Search Consultants. ▶

THORNTON MAY

## In search of great IT literature

**S**EVERAL YEARS ago, while facilitating a development session for a group of the CIO's direct reports at a Fortune 250 company, I went around the room of 20 earnest destined-for-greatness executives and asked them as a painless way of introducing themselves to share their names, their roles and the books they were currently reading.

As a liberal arts grad of Dartmouth College, I had been led to believe that what you read was a window into your soul and a mirror of your true persona. The group I was working with that day was apparently soulless. The exercise, which made them feel uncomfortable, almost lost us the engagement. The first several individuals seemed to have trouble with both the verb (reading) and the noun (book). One individual asked if I wanted to know what he was really



THORNTON MAY is vice president of research and education and senior editor of the Cambridge Technology Partners Inc. in Cambridge, Mass. Contact him at [tmay@cambridge.com](mailto:tmay@cambridge.com).

reading, I said, "yes" and he responded, "The Palm Pilot Manual." One executive — admittedly from the Web side of the house — explained that book reading was no longer part of what she did. What I heard seemed to substantiate what I believed was the misguided stereotype of IT leaders as biggenically challenged geeks who socialize poorly, worship machines and are generally uneducated, unlettered boors.

In a panic of denial, I attributed this lack of reading to the intensity of the current environment that group of IT leaders found themselves in; they had no real time for reading, I reasoned. I also blamed myself for poorly structuring the exercise. I should have asked, What's the most important book you've read in the past three years?

At the next company we visited, I asked that rephrased question. Again, I was surprised at the responses. Several IT leaders cited major business best-sellers. This was very consistent with the then-prevalent objective of linking, or aligning, with the demand side of the house as a way to understand how end users think. A few cited a subset of the great works of Western literature, with Shakespeare and Dickens the most prominent. The remaining responses parsed into tribal reading sects — software project managers cited *The Mythical Man Month*, while IT leaders who formerly worked in product development for vendors chose *The Soul of the New Machine*. IT leaders in the advanced technology group said *Crossing the Chasm* or books by futurists, and the alpha-geeks cited technical manuals and Web sites. The freakies (individuals known for contrarian thinking) picked either science fiction classics or Dr. Seuss. I'm pleased to say that no one mentioned the lame, self-serving puff pieces from the ghostwriters of vendor CEOs.

As I stepped back from the exercise, I concluded that the literature of IT stinks. IT is one of the most powerful forces of change on the planet, yet a set of great IT books apparently doesn't exist.

If your board of directors or CEO asked you, as an IT leader, what book they should read that lays out how the world has changed or is changing and what their responsibilities as executives should be in managing IT, what would you tell them?

As you examine literature that has changed people's lives, IT tones are noticeably absent. Gunnar Myrdal's *An American Dilemma* (1944) changed our understanding of race relations and profoundly influenced the civil-rights revolution of the 1950s and '60s.

David Reisman's *The Lonely Crowd* (1950) chronicled a sea change in behavior from a production-oriented to a consumption-driven U.S. economy.

Rachel Carson's *Silent Spring* (1962) gave rise to the modern U.S. environmental movement, framing a powerful call to arms for citizens of the world to mobilize and stop man's destruction of nature.

If we are what we read, we're in big trouble. The time has come for somebody to create such a literary "call to arms" for the new IT-intensive economy. ▶

## NEWSREADERS' LETTERS

### **Is AOL another Microsoft?**

**W**HAT I READ in "AOL Proposes Instant Messaging Standards" [Computerworld Online, June 16] looks like more profit-centered buffalo chips from AOL. Didn't we just prosecute Microsoft for setting standards around its industry-leading operating systems and browsers? Let AOL have its way and we'll all be wrapped up behind its choking, "protective" gated communities.

**Joe V. Bolin**  
Systems analyst  
Moutre Ga.

### **Data privacy principles**

**T**HE ARTICLE "EU Overwhelmingly Approves U.S. Data Privacy Regulations" [News, June 5] discussed the European data privacy regulations and recent tentative agreements with the U.S. However, I haven't seen an explanation about what the EU's rules are. As IT folks and people concerned with privacy, your readers should be aware of what is involved and the obligations of data collection entities.

According to Computer Ethics (MIT Press), the EU's Convention for the Protection of Individuals With Regard to Automatic Processing of Personal Data sets out the following guidelines for member countries regarding privacy:

**1. The Collection and Limitation Principle.** Data can be obtained only by lawful means and with the data subject's knowledge or consent.

**2. The Data Quality Principle.** A data collector may collect only data relevant to its purposes, and such data must be kept up-to-date, accurate and complete.

**3. The Purpose Specification Principle.** At the time of collection, the purposes to which the data will be applied must be disclosed to the subject, and the data shall not be used for purposes beyond this.

**4. The Use Limitation Principle.** The data is not to be disclosed by the collector to outsiders without the consent of the subject, unless disclosure is required by law.

**5. The Security Safeguards Principle.** Data collectors must

take reasonable precautions against loss, destruction or unauthorized use, modification or disclosure of data.

**6. The Openness Principle.** The subject should be able to de-

termine the whereabouts, use and purpose of personal data relating to him.

**7. The Individual Participation Principle.** The subject has the right to inspect data concern-

ing him as well as the right to challenge the accuracy of such data and to have it rectified or erased.

**8. The Accountability Principle.** The data collector is account-

able to the subject in complying with the above principles.

**Barbara Taylor**  
Rainbow & Miracles Inc.  
Silverado, Calif.  
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# BUSINESS

## IN FOCUS

How do you stay focused on your work while still managing to find the time to market your products? Packet Design, a Silicon Valley start-up, plans to develop technologies, then spin off new companies to market them. Packet Design will retain part of each new company as it moves on to new projects. » **33**

## DULL DEMISE

The slew of recent dot-com failures is disappointing, writes Kevin Fogarty. Not because anyone thought the dearly departed companies would survive forever, but because of the banality of their demises. What finally did them in was their ignorance of the simplest rules of business — you need cash and you need customers. » **33**

## FINANCIAL SUCCESS

What's the going rate for IT employees in the financial services industry? Check out the range of earnings from AG Barrington's recent salary survey. » **34**

## WORD OF MOUTH

For many companies, employee referrals are the most effective recruiting tool in today's tight labor market. But creating a good referral program isn't easy. Find out how businesses like travel-services firm Carlson Cos. are developing and maintaining top-notch referral programs. » **35**

## TO YOUR HEALTH

Many IT professionals find themselves spending so many hours in the office that they have little time to eat properly and exercise. But more veteran workers say they are learning their lessons and are fighting to strike a healthy balance between work and personal time. » **36**

## TOY SMARTS

As online retailers gird for the holiday season, Toysrus.com is beefing up its infrastructure to make sure it avoids last year's mistakes. CEO John Barbour talks to Computerworld about lessons learned and preparations for this year's rush. » **42**

## SOARING ENROLLMENTS

Word of high salaries and plentiful jobs seems to be spreading among college students. MIS program enrollments are so high that the new challenge is not attracting students, but accommodating them. » **44**

## GLOBAL DEMAND

By 2003, Americans are expected to make up only one-third of the online population, meaning there's literally a whole world of customers out there. To capture overseas markets, many companies are racing to globalize their Web sites. » **46**

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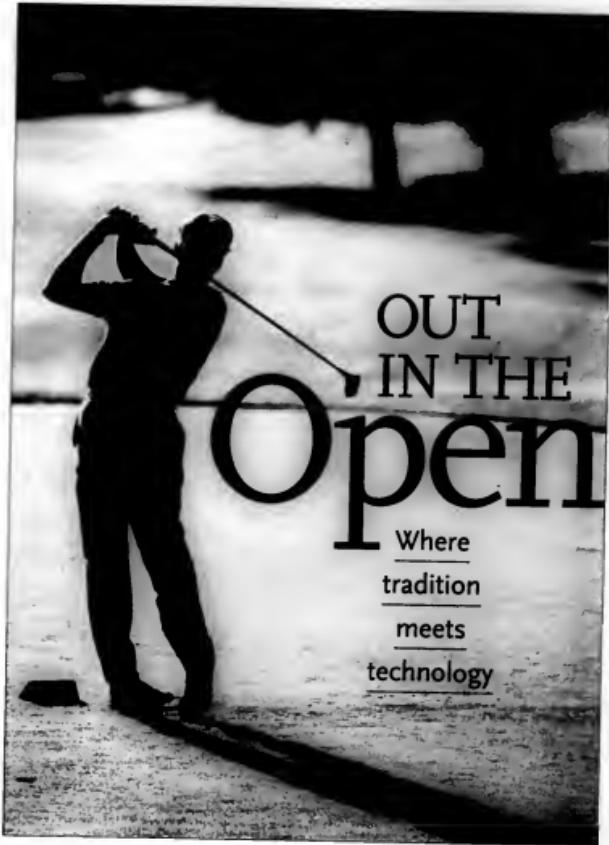


## STAVING OFF THE GRINCH

**GET READY.** With online revenues expected to climb 85% from last year, businesses can expect to face a holiday rush like none other. In order to prevent fiascoes such as Toysrus.com's inability to deliver toys in time for Christmas last year, online retailers are revisiting past disasters and scrambling to ensure that they won't see any repeat performances.

38

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Unisys and the Royal and  
Ancient Golf Club of St. Andrews  
have forged a unique partnership to develop  
the most sophisticated and capable of  
computerized scoring information systems.

## A FINE

latch

ARGUABLY THE MOST traditional and precise of all sports, golf has changed remarkably little in its 600-year history. The object of the game remains to hit a little ball up to a quarter of a mile past, around, and over numerous obstacles and hazards, and have it roll into a small hole dug into the earth.

The very essence of this tradition and precision unfolds at the oldest of golf championships, the British Open, where the world's finest golfers tee off this summer from the exact same turf at St. Andrews in Scotland where golfballs first took flight in the early 1400s.

While thousands of spectators jam the wind-swept links to watch the golf masters at work, millions more around the world follow the action on television and, increasingly, on the Web. And owing to another partnership steeped in a tradition of excellence and precision, all these fans can track the scores and standings of their favorite golfers within seconds of a ball dropping into any of the notorious holes at St. Andrews' Old Course.



"They've given us and the media a simple-to-use system that allows users to extract very complex information very quickly. I know what they are doing is anything but simple, yet they make it look easy."

**Stewart McDougall, press officer of The Open Golf Championship**

With more than 20 years together, Unisys and the Royal and Ancient Golf Club of St. Andrews have forged a unique partnership to develop the most sophisticated and capable of computerized scoring information systems. With scoring updates sent in

real time to major media outlets for processing in a variety of applications, the scoring system is an expression of leading-edge, mission-critical, fault-tolerant computing in support of tradition and individual excellence.

This will be our 21st year with the

Royal and Ancient Golf Club," says David Fox, manager of the Global Sports Marketing Program for Unisys, "and we are providing scoring data and date-crunching applications to major media, including the BBC, ABC, ESPN, Japan's TV Asahi, and BBC Radio. In addition to the British Open, Unisys provides the scoring information system for a second Grand Slam golf event, the U.S. Open, as well as for the U.S. Women's Open, the U.S. Amateur, all the European PGA Tour events, the Australian Tour, and the World Amateur Championship, making Unisys the world's premier enterprise solution provider for major golf events."

"Unisys adds huge value to us and to our work," notes Barbara Slater, executive producer with the British Broadcasting Corporation (BBC), who has covered The Open since 1984. The BBC is among the largest users of Unisys scoring data. "They have always worked to understand what we are trying to do. It's a real partnership we have with them and, as a result, we've progressed together."

#### BEHIND THE CURTAIN

Slater's staff and some 400 other journalists and media broadcasters spend much of their time at the Media Center, run by "event CIO" Stewart McDougall, press officer of The Open Golf Championship. Echoing Slater's experience working with Unisys, McDougall says, "They've given us and the media a simple-to-use system that allows users to extract very complex information very quickly. I know what they are doing is anything but simple, yet they make it look easy."

The scoring system is a master-

## Bringing You The Wind

Television production teams constantly strive to enhance their viewers' enjoyment and understanding of sports events. That often means attempting to show the viewers just what the players are experiencing. In championship golf, shifting wind conditions have spelled boom and bust for countless golfers.

Until recently, swirling tree branches and the muffled sound of gusts beating against microphones were the only clues the television audience had for gauging wind conditions on the course.

Thus, a couple years ago, ABC Sports presented Unisys with a challenge: Develop technology to allow TV viewers to "see" the wind.

The result is the "wind stick," a fully portable, telescoping telemetry station, extendable to 18 feet and consisting of a precision anemometer and a wind vane. Into a lunchbox-sized, weatherproof case, Unisys packaged a micro-controller, radio modem, battery, and custom-designed interface card that connects the instruments to the components, while providing a simple operator interface.

Running custom software developed by Unisys, the micro-controller samples the instruments, calculates wind speed and direction, and feeds the data via modem to a base-station PC.

Other Unisys software merges the wind telemetry data with graphics software, producing, at the director's command, the now-common ABC sports graphic. (The BBC has also begun using this innovative system.) The portable nature of the wind stick allows operators to move with a group of golfers and to sample fickle winds at different points of the hole, such as at the tee or at an elevated green.



The wind stick dramatizes gusts on the greens.

work of ingenuity that is flexible enough to evolve with the rapidly changing needs of the media and of the golf-watching public. For example, in the United Kingdom, the majority of BBC television viewers

system gathers throughout The Open?

The action starts right at greenside. The moment a player's putt drops in the hole, a greenside scorer enters the play data into a handheld terminal. The information is instantly radioed to the Unisys data-center-on-wheels on the course grounds. Servers there immediately enter the score and feed the information to the hundreds of media at work in the Media Center and in the separate booths and trailers of the BBC, ABC, and others. Servers also instantly update various Web sites, including The Open's own site, [www.opengolf.com](http://www.opengolf.com).

All this occurs by the time the golfer has tipped his hat to the crowd and stooped over to retrieve his ball.

Unisys recognized early on the heady challenge of building a fault-tolerant system, given the temporary and exposed nature of the system components. The system is set up over 10 days and dismantled in just one. During the event, thousands of spectators troop over some five miles of cable, while blithely knocking against phone conduits and other network equipment.

"So we use the network in place as little as possible, using it primarily to move scoring changes to the hundreds of terminals we feed," observes Jeff Schroeder, Unisys technical manager. "Applications are on the PCs themselves, which continue to function even if the flow of scoring updates is disrupted temporarily. So even if the network is down, you don't present a blank screen and look like you are down."

This guaranteed uptime of the



Laying the cables which carry data to and from the Media Center

The Open are not golfers.

"That means our broadcasts have an education and explanation role to fill," says BBC's Slater. "We want to increase their enjoyment, and we work with Unisys on ways to do just that." One such innovation is tracking data on the precise distance a golfer's ball is from the hole on any given stroke—data that can be presented to viewers graphically in a number of ways.

#### FROM PUTTS TO DATA

Just how do these and other data get from the course to the myriad applications the media use to create entertaining coverage? And what are some of the most common applications Unisys has developed to process and interpret the scoring information its

## Shoulders Of Giants

Mission-critical information systems must carry on their vital work no matter what the environmental obstacles. The British Open has provided its own set of unique, if not amusing, challenges to keeping the Unisys scoring information system up and running.

Take, for example, the time a beer truck pulled up for a delivery not far from the Media Center. The driver lowered the lorry's lift gate directly across several cables, severing them completely. Fortunately, the fully-distributed nature of the Unisys architecture allowed the workstations to continue processing the most current scoring information available until the lines could be reconnected.

Then there was the time some journalists in the Media Center noticed intermittent, rhythmic disruptions on their screens. Troubleshooters soon located the problem source: a nervous golfer waiting his turn to play. It seems he was tapping his spiked shoe against a cable underfoot.

With 20 years of Open experience under its belt and 15 engineers, software experts and other staff on site, Unisys manages to keep the scoring system up and running through every common and quirky obstacle, notes Jeff Schroeder, technical manager of sports marketing at Unisys.

"Knowing all that can go wrong when so much of the system is put up only temporarily, we make sure we have strong performance-monitoring systems in place," Schroeder says. "Quite often we are able to detect and fix a problem before anybody is aware anything is wrong in the first place."

## Advertising Supplement

nodes on the network, regardless of what happens to the network itself, is owed to a proprietary and highly resilient network protocol Unisys built for its scoring system. Each of the terminals and servers in the data center forms one piece of a truly distributed system running a custom-built database. This way, the sometimes-finicky network is hidden from the performance picture.

In addition, the Unisys team uses ultra-modern network connections such as fiber optics. The reason? "We can get any phone person in the

country to fix a standard wire line, but that just isn't the case with a piece of optical cable," Schroeder says. "In this way, we keep our network connections running over what, in this case, is the simplest and most robust technology available."

### FROM DATA TO ENTERTAINMENT

With safely delivered information currently delivered to hundreds of terminals and workstations on site, the Unisys-engineered applications kick in. Whether it is a television station in Stockholm that wants a scoring and

position update of key Swedish players, or a producer at ESPN looking for scoring data on the toughest holes, the information is readily available from the menu-driven system.

"It's amazing how easy they've made it to get so much information presented so many different ways," says McDougall. "The system makes the media so much better at doing its job."

Included among the many ways Unisys applications present raw scoring data are:

- A detailed leader board showing

## Fast Facts:

■ From simple beginnings in the early 1400s, golf became so popular at St. Andrews that King James II banned the game in 1453, feeling it distracted young men from archery practice. The ban was repealed in 1502 by James IV, himself an avid golfer.

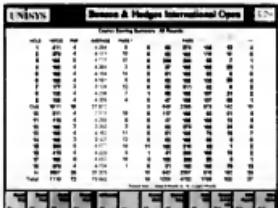
■ The first Open Championship was played on the Old Course in 1873. In this first year of the New Millennium, The Open will be played for the 26th time at St. Andrews.

■ The Old Course features a daunting 112 sand traps. The faces of the two most treacherous traps were built using railroad sleeper cars sunk into a concrete base beneath the wall of the actual playing turf, which is 10 feet above where a golfer must try to blast his ball.

■ The largest green measures more than 1.5 acres.

■ There are six golf courses comprising the St. Andrews Links. All of them, including the famed Old Course, are open to the public, reflecting the intentions of King David, who gave the links land as common land for townspeople in 1123.





The Unisys course summary

scores on individual holes for the 190+ golfers in the tournament;

- Statistical leader boards detailing data such as the number of fairways golfers hit off the tee, the average or maximum drive lengths on specified holes, greens reached in regulation (by the second shot on a par 4, the third on a par 5), total putts taken by individuals, or the average putting of entire groups of golfers;

- A group-locator allowing the media to track the status of specific pairs of golfers on the course;

- Scoring distribution graphs showing the members and identities of golfers playing at par, or at any number of strokes above or below par;

- Golfer pairings by tee time, alphabetically, or by nationality;

- A "cut projection" tote that provides highly accurate forecasts of which players on the courses are likely to score well enough to continue playing on the last two days of the tournament, and which are destined for an early shower.

"It's usually a matter of one click and, just like that, we've got the information we want," observes Slater. "The screens are clean and easy to read. Their pages are TV-friendly. It's

just great stuff."

Working with the media clients and the Royal and Ancient Golf Club, Unisys continues to evolve the scoring system with an eye toward incorporating leading-edge technologies. Slater notes that the BBC is mulling the use of virtual reality technology that will visually place TV viewers in an animated, real-time setting faced by a particular golfer in a specific situation on the course. The handheld greenside terminals are destined to be replaced by intelligent palm-top devices that will leverage that intelligence, as well as cellular connectivity, to speed match



The British Open staff update a leader board as the crowds watch on.

updates to the media and to the world's viewers.

"While respecting our traditions, Unisys has done so much to pioneer the speedy delivery of Open information throughout the world," says Duncan Weir, golf development secretary at the Royal and Ancient. "We certainly plan to continue our long relationship with them."

## Old & New

Ask any golfer worth his weight in bunker sand why golf courses have 18 holes. He'll tell you it's because that's how many holes there are at the Old Course at St. Andrews in Scotland. Actually, there were 22 holes originally. In 1764, when golf at the course entered its 350th year, these were reduced to 18 holes.

Unlike any other championship course in the world, the Old Course, with its undulating fairways, hellacious sand traps, and double (two-holed) greens yielding putts as long as 100 yards, was not designed by an architect. Rather, it evolved with tradition and time over six centuries of play.

"We deeply respect tradition here at St. Andrews and certainly at The Open, which is the oldest major golf championship and the only one played outside the U.S.," notes Duncan Weir, golf development secretary at the Royal and Ancient Golf Club of St. Andrews. "But at the same time, we've had to be at the forefront of technological advancement over the years. At the base of that has been our relationship with Unisys. Unisys is among a very small number of companies we call official suppliers—our most trusted companies with whom we've had long-term relationships and who provide an essential service."

The relationship has flourished since the earliest days when Unisys developed the first computerized scoring system 20 years ago. "Unisys' quality and delivery of service is first-class, no doubt about that," Weir concludes. "They are constantly working with us to try to improve that service."

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# Start-up to Focus on R&D, Not Marketing

*Will use unique spin-off business model*

**BY PETER FOX**  
**I**N SILICON VALLEY, the start-up-in-search-of-an-IPO is cliché, and the pure research and development lab is an unsustainable dream for many engineers.

Now a group of Silicon Valley veterans is trying to combine the two in a company whose goal is to design technology for specific needs, turn marketing of the technology over to outsiders and go on to the next development project.

The goal of the brand-new Packet Design, founded by Judy Estrin, is to develop Internet Protocol services tech-

nologies that enhance the performance, scalability, provisioning and ease-of-use properties of the Internet infrastructure.

Examples of the kinds of technologies which Packet Design will be dealing are optical networking, voice/data convergence and ways to sell the Internet to support a vastly larger number of users.

All of the technology developments from Packet Design will be spun off as separate venture-funded businesses that will turn the technology into a product or license it to other developers. Packet Design's president and CEO.

make money by getting a piece of each new spin-off.

That way, Packet Design can focus exclusively on developing technology, not marketing or selling it, said Estrin, Packet Design's president and CEO.

Why this business model? "Hobnob is thinking anymore," Estrin said. "Everyone is so time-to-market-focused that you've got a situation where it is difficult to solve problems that aren't related to the present quarter. Everyone is operating on Internet time. At Packet Design, our time horizon is a little broader."

But what about the research parks and the labs, such as Lawrence Livermore National Laboratory in Berkeley, Calif.? "They are great," said Estrin,

"but their time frames are too long for most companies to really benefit from their solutions, and they aren't tackling specific problems dealing with the growth of Internet traffic."

Estrin has co-founded three successful technology companies with her husband, Bill Carrico. They co-founded router-maker Bridge Communications, which were public and merged with 3Com Corp.

They also founded X terminal maker Network Computing Devices Inc. (NCD), which went public in 1992, and streaming video software maker Precept Software Inc., where Estrin served as CEO until it was acquired by Cisco Systems Inc.

In other words, Estrin and Carrico, have what Hollywood would call a track record, and Packet Design boasts a stable of other bankable stars.

**JUDY ESTRIN says,**  
**"Everyone is operating on Internet time."**

The company also has \$24 million in backing from Foundation Capital, Carrico, Estrin and individual investors, including former Netscape Communications Corp. CEO James Barksdale.

"Judy and Bill are recognized as visionaries, but public investors are willing to pay a premium for companies with experienced management in place," said Christian Armano,

cost, an analyst at SG Cowen Securities Corp. in Boston.

"But success will be based on the ability of the new company to attract and retain talented management to take the company forward."

KEVIN FOGARTY/BRICKS AND CLICKS

## The banality of failure

**Y**OU KNOW WHAT disappoints me about the recent flameouts among the dot-coms? Not that it's happening — everyone knew it was coming. Having dot-com as part of your company name is practically an advertisement that you plan to live fast and die young.

No, it's the banality of the failures. They're not dying in horrible economic cataclysms or being crushed by deep-pocketed brick-and-mortar rivals or hacked out of existence by manic crackers bent on destroying capitalism on the Web. They're just running out of money. And customers.

Sure, that happens to normal companies. That's corporate evolution, right? Survival of the fittest.

But the dot-coms weren't normal companies in any sense. From the beginning, they were Something Different.

They broke all the rules. They had more cash than

they had any right to have. Their stock prices were stratospheric, based more on faith than reality. They took over Wall Street and turned it into a ya-ya. They made a lot of people rich.

They defied the laws of physics.

They defied Alan Greenspan.

They were superstars. They should have died like those movie stars of the '50s: foot on the gas pedal, wind in their hair, daring Deadman's Curve to live up to its name. Not like Elvis, in a lonely bathroom with their pants around their ankles.

But that's what's happening. Glamorous companies

are going down the tubes for reasons that they were supposed to have overcome while inventing the New Economy.

Toysmart CEO David Lord tells a dramatic story about trying to pull his company back from the brink. After hitting a low point, he and his top execs worked around the clock to hammer out a new business plan that would convince majority partner Walt Disney that they were still on the road to success. They celebrated the brilliant solution the night before the presentation. In the same meeting they presented the plan, Disney shut them down.

Time, Lord says, was a problem. Lack of faith from Disney, he says, was a problem. A culture

clash with Disney, he says, was a problem.

But ultimately, he says, the problem was that Toymart couldn't attract enough customers.

That's not a New Economy kind of excuse. In the New Economy, smart companies are supposed to succeed anyway.

But even smart New Economy companies are failing. A study from Chicago outplacement company Challenger, Gray & Christmas found that almost 5,400 employees from 59 Internet companies have been laid off since January. Toymart is gone. Boo.com is gone. New Economy pioneer CDnow is trying to sell out but

can't find a buyer. Even Amazon.com is coming under fire.

E-commerce isn't easy. Even traditional companies with existing bases of customers to exploit have trouble making it work.

Online, histor-

ical return-on-investment criteria don't work, so developing e-commerce projects have to be funded as a leap of faith — more on an R&D basis than a traditional commercial one, according to Kathy Brittain White, CIO at \$26 billion Cardinal Health Care. And companies with real-world revenue streams can afford to keep that up longer than start-ups.

But there's a limit even to leaps of faith. Among the dot-coms, it was an article of faith that the old roles of business no longer applied. Some of the old rules, maybe, but not all. If you're smart enough, agile enough and offer enough value to customers, you can build a customer base from nothing.

But if you can't make money at it, you can't keep it up. No matter how crass that is, no matter how mundane, no matter how banal, that rule still applies.

And it's taking its toll. Even though there really should be a more stylish, more spectacular, a more New Economy way to go, failure is still just failure.



KEVIN FOGARTY is Computerworld's Business editor. Contact him at [kfofogarty@computerworld.com](mailto:kfofogarty@computerworld.com).

PETER FINGAR

## Vital value chains

**E**ARLY ENTRANTS in B-to-B and B-to-C Internet markets gained their customer bases through first-mover strategies and initiatives, such as Amazon.com's surprise attack on the book industry in the

mid-'90s. But as the novelty of e-commerce begins to fade, it's the power of a company's value chain—not just its initial customer base—that will emerge as the deciding factor for future online success.

Companies that "get it" realize that in the future, competing will be about turning a company, and its entire value chain, over to the command and control of the customer.

For example, when a customer goes to Dell for a build-to-order

computer, Dell's suppliers and the suppliers' suppliers are linked into the transaction in real time to trigger fulfillment and inventory replenishment. The customer is in the driver's seat initiating activities that ripple throughout the value chain.

Customers, who can compare prices and search for suppliers without leaving their browsers, hold absolute power in the new economy.

Instead of owning the product and pushing it to market segments, suc-

cessful Internet age companies are turning control over to empowered customers, making it easier for them to pull products and services from a multitude of suppliers.

General Electric's Trading Process Network pioneered this concept in the business-to-business market, bringing together multiple buyers and suppliers with aggregated catalogs and sophisticated trading.

In the business-to-consumer market, customers hold the purchasing power that they buy through Mercata.com, an online collaborative that brings together buyers seeking the same products. They are then connected with suppliers, which offer them lower prices, since there's only one large transaction to handle.

Such instant buyer cooperatives weren't possible before e-commerce, but now suppliers that don't embrace these new business models won't appear on the consumer's radar.

E-commerce calls to us to re-engineer not just our companies, but also complete industries. We must extend our internal business processes to the outside world: cus-

tomers, suppliers and trading partners. As a result, competition among companies like Sears and J.C. Penney will be less about brand and more about the strength and efficiency of each firm's value chain.

How does a company protect its position? The struggle is to own the primary relationship with the ultimate customer served by the value chain.

For instance, last June, Home Depot notified 1,000 suppliers, including Black & Decker and GE, that it will hesitate to do business with suppliers that also market their products online. Home Depot said it would be happy to partner with them on selling via the Internet, but maintaining the primary relationship with the ultimate customer is Home Depot's obvious rule of engagement.

But putting the concepts into practice is the hard part. So what are IT managers to do?

Foremost, they must recognize that the challenge of continuous value-chain optimization goes beyond their companies' walls to their trading partners. Companies can't go it alone. ♦



PETER FINGAR, Technology consultant at EG Guggenheim Inc., in Westborough, Mass., is the author of *Enterprise E-Commerce*.

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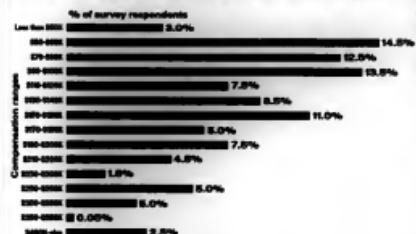
### SNAPSHOT

#### Financial Fortunes

AG Barrington Inc., a New York-based financial technology recruitment and research firm, recently released the results of a salary survey studying the 1999 compensation packages of information technology professionals in the financial services industry.

Of the 200 mid- and senior-level professionals surveyed, 87% received some form of compensation in addition to their base salaries, with 15% earning stock or options. However, only 17% of those who received equity were employed directly by securities or investment management firms. The rest worked directly for vendor firms.

CEOs and CFOs make the highest salaries, ranging from \$130,000 to \$5 million in total annual compensation, according to Alan Geller, AG Barrington's managing director. The lowest salaries belong to quality assurance testers and documentation specialists, whose salaries fall in the \$45,000 to \$55,000 range.



## BUSINESS CASE STUDY

# Filling Slots With Inside Referrals

A firm rewards employees for finding and nurturing new hires. By Julekha Dash

**T**HREE DAYS, GIVEN THE TIGHT labor market for information technology workers, just about every company is rewarding employees who bring their friends on board.

But establishing a successful IT employee referral program isn't as simple as writing a check out to someone who makes a recommendation. It takes careful planning and constant promotion, according to Lynne Carroll, an IT recruiter at Minneapolis-based travel services firm Carlson Cos.

Carlson's employee referral reward

includes two unique features: Not only do employees receive both a lump sum and a deferred payment, but they're also given an incentive to look after their referrals once they're on the job.

Employees at Carlson who refer IT workers with at least two years of experience receive \$2,000 up front, followed by \$1,000 every year for four years, as long as both employees remain at Carlson. "This keeps everybody involved in making sure that people are happy with their jobs," says Carroll. The effort has paid off: More

than one-fifth of the company's new IT hires so far this year have been employee referrals.

### Promoting the Cause

Managers need to constantly remind employees that they can receive cash for recommending their friends, says Carroll. "An employee referral program has to be constantly promoted, or it will be forgotten if it's not talked about a lot," she says.

And when they promote open positions, companies should be as specific as possible about the job requirements, according to David Foote, a managing partner at Foote Partners LLC, a New Canaan, Conn.-based consultancy that specializes in IT workforce issues.

Foote recommends that firms list several paragraphs describing the kind of technical work experience and business aptitude candidates should have, instead of simply posting a list of open positions.

At least once every six months, Carlson profiles employees who have recently brought their friends on board, in both online and hard-copy newsletters. A story featuring someone who nabbed \$8,000 on the spot after referring four friends, for example, makes for a compelling story that sticks in workers' minds, Carroll says.

The company posts approximately a half-dozen flyers promoting the employee referral program in each of its three buildings. The flyers contain the form that employees need to fill out to receive credit for referring a new hire.

Carlson also lets employees fill out the forms online, or they can receive a form through the human resources department. New employees also receive the form, as well details about the referral programs, as soon as they walk through the door. "On their first day, we dangle this carrot in front of them, [asking employees] who else can they refer," says Carroll.

Janet Kreider, a senior business analyst at Carlson, has referred eight friends in the past, four of whom were hired. One referral, a project manager, was a neighbor whose company was

### AT A GLANCE

#### Carlson Cos.

- Last year's sales: \$34.4 billion
- Employees worldwide: 40,000
- Headquarters: Minneapolis
- Web: [www.carlson.com](http://www.carlson.com)

#### Carlson's employee referral program:

- For senior IT workers: An employee receives \$2,000 when the candidate is hired, plus an additional \$1,000 per year for four years, given that both employees still work at Carlson. Total amount: \$6,000
- For junior IT workers (as well as non-IT workers): An employee receives \$500 up front and an additional sum — up to \$3,000, depending on the position — six months after the hire.

#### Average employee referral bonus:

- Range: Between \$1,000 and \$2,500
- High end: IT: \$5,000
- Recruiting fees, in comparison: 25% to 30% of the new hire's salary, or \$16,000 to \$24,000 for a salaried worker earning \$60,000, \$72,000 to \$16,000 for a worker earning a \$60,000 salary.

SOURCE: DAVID FOOTE PARTNERS LLC

#### How to establish an IT employee referral program:

- Promote, promote, promote the program. This can include sending e-mails, posting flyers and including mentions of it in company newsletters.
- Spread out the payment over time. Provide a lump sum up front, followed by an additional amount if the new hire stays for a certain length of time.
- Make it simple for employees to get information about how to refer friends and reap the rewards.
- Tell employees about the program their first day on the job.
- Consider having a raffle and awarding an extra bonus to employees who have referred friends.
- Be as detailed as possible about the job requirements and required skills for candidates.

about to relocate to another part of the country — a move that didn't interest him.

#### From Far and Wide

Kreider says Carlson's constant promotion of the referral program and its relatively easy process for submitting a recommendation has led her to consistently participate.

Managers can also take more subtle steps to promote the IT referral program. For example, Scott Dinsdale, chief technology officer at FirstLook.com, a Sherman Oaks, Calif.-based entertainment Web site, has many informal conversations with the company's Web and software developers to see if they know of potential new hires. This tactic has enabled Dinsdale to find good candidates, some of whom flew all the way from Ohio to his interview.

Moreover, since developers tend to belong to a closely knit community, they are more likely to refer their friends, Dinsdale says. ▶

"AN EMPLOYEE REFERRAL program has to be constantly promoted," advises Lynn Carroll, an IT recruiter at Carlson Cos.

## WORKSTYLES

### Hectic Pace of IT Affecting Health

As a high-tech special effects creator at a major motion picture company in Los Angeles, Pat Roberts led a life that many knew all too well.

After a few hours of sleep, Roberts would wake from his (his company remains anonymous) would go to work without eating breakfast, skip lunch and eat only snacks and dinner.

Then his health started to deteriorate.

Roberts' doctors aren't sure what's been ailing him, but they do know his diet and lack of sleep were the root causes.

"I thought I was healthy," he said. "I'm a vegetarian."

The doctors have put him on a special low-carbohydrate diet, and he tries to get more sleep. He said he notices a difference — he has more energy to work on his beloved projects.

Roberts isn't alone. In today's 24/7 market, many technology professionals find themselves working on dual and even triple time because of the long hours they put in at work.

Dave Berwick, a senior programmer at Sunnyvale, Calif.-based VA Linux Systems Inc., said he sleeps an average of three hours per night. He pops caffeine pills and down soda to stay alert.

But the hard work is worth it, he said. At 23, he has a condo in Boston's tony Back Bay and he's convinced that he'll be able to retire by the time he's 30.

While he tries to eat healthy foods, he acknowledges that his habits could be destructive. But right now, he said, he feels immortal.

Bob Cohen, senior vice president of the Information Technology Association of America in Arlington, Va., said companies are becoming aware of employees' health needs.

"It really is an extremely competitive world among employers, so what differentiates them is the packages they're able to put together to attract workers," Cohen said. "Companies know there is a direct link between the happiness of employees and the success of the company."

Like Roberts, Robby Messer, 31, said he learned the importance of striking a balance between work and personal time.

When he was an IT consultant, he would travel three weeks, but of the month. Family

time for him was a brief phone call home between projects. Fast food and vending machine snacks were his "family" meals, he said.

"Obviously, fast food was the easiest thing to do. But now I try to stay away from that, and bring things from home like fresh veggie and fruit," he said. "I also try to get a balanced hot meal."

Messerow eventually gave up consulting and now works in the IT department at Greater Boston Radio Group so he can live closer to his family.

Brian Sullivan, a 35-year-old husband and father who telecommutes from his Framingham, Mass., home for North Carolina-based Datacom Inc., said things seem to be changing. Many of his friends in IT are leaving work at 6 or 6 p.m. — but when they return, they're bringing their work home with them, he said.

"On one side of the belt, they've got a paper, on the other side, they've got a cell phone. They say, 'You can't leave the company's going to hold you overnight.'

Sullivan said he refuses to carry a cell phone or pager and, if necessary, if ever, uses his computer outside of work.

But since he works at home, he often finds himself working outside of "office" hours.

If dinner is ready and the "million-dollar customer" calls, you can't tell him you'll call him back later, said Sullivan.

But Sullivan said he's careful about striking a balance. Like Berwick, he used to pull 10-hour hours when he was in college.

"I knew what I was doing was impacting the company," he said. But when he got a dose of reality when he saw his 20-year-old son get cut down to 13 "I came into perspective," he said.

People his age have seen the effects of layoffs and have learned the hard way that they're not indispensable, Sullivan said. It's a lesson he hopes today's twenty-somethings grasp before it's too late.

They're all expecting that they're going to land \$50,000 jobs out of school "and get 10% raises each year," he said. "And they're buying the \$40,000 homes. But it will get bad again. They just really need a serious reality check."

- Meghan Holohan

PETER G. W. KEEN

## eCRM: The new ERP

CUSTOMER RELATIONSHIP management for the online business era — or eCRM — is the next major multiyear IT initiative. It's a mix of data mining, call center management, customer profiling software, sales force automation, "clickstream" analysis, marketing process

automation, Web site personalization, e-mail auto response, segmentation algorithms and other exotic software species. It's by far the biggest and most complex venture in the history of IT, even bigger than ERP.

Here's a formula to remember: P = ERP.

The P stands for "payoff" or "problem." The payoffs and problems of eCRM will be exponentially greater than those of ERP. On the surface, eCRM looks like just another software and database management environment. So did ERP. Many companies evaluated the features offered by leading package providers like SAP, J.D. Edwards, Baan and PeopleSoft and went through the standard systems development planning and project management procedures.

For most, ERP turned out to be anything but standard. The work required to clean up processes and interfaces, and to rationalize procedures and infrastructures, dwarfed the effort needed for software installation and customization. My rule of thumb: A major SAP project costs about three and a half times its original budget and takes three and a half times the original schedule to complete.

That's obviously a problem, but in many instances, a payoff awaited. I was a deep pessimist about Y2k; but in looking back at why I was so wrong, I've concluded that I misjudged the impact of ERP on transforming the entire operating infrastructure of IT and on cleaning up a legacy of software and data mishmash.

Now comes eCRM. Processes, interfaces, data, networking, software — the scale and complexity are vast. For example, eCRM demands that companies provide consistent and up-to-date customer, catalog, order and inventory data across all their sales channels — Web, call center and physical points of presence. How do you even conceptualize the infrastructure, processes and IT bases for achieving this? Electronic CRM makes ERP look small and easy by comparison.

But sadly, most companies I deal with clearly underestimate the scale and complexity of eCRM, even more so than they did for ERP. They're also repeating the most basic mistake of

the ERP era: looking for the software package that, for them, embodies what eCRM is all about. For ERP, that package was SAP. For eCRM, it's Siebel. Those vendors have many strengths, but software doesn't substitute for clarity of business model, quality of business process base, IT infrastructure design and operation, integration costs or effective use of the software tools and data.

What should IT organizations do? First, go back and review what happened in your ERP ventures. What went wrong or right with ERP will almost surely happen with eCRM. Whatever was unanticipated or underestimated then will likely be the same today. These are commonsense defensive measures to protect against the old adage that those who ignore history are condemned to repeat it.

Most logically, I recommend that IT organizations leave the software installation until last.

They may end up choosing Siebel, BroadVision, Oracle or any of the other elite providers, but that should be the end point. Before that, address the following, in order:

1. Design the customer experience; it's customer relationship management.
2. Focus on the use of eCRM: customer segmentation, pricing, personalization and service.
3. Ensure from the start a plan for multichannel eCRM integration.
4. Think process, not system: marketing, selling, service.
5. Then and only then, think software.

In other words, learn from ERP so you can reduce the "problem" quotient of my formula and leverage the "payoff" quotient. Electronic CRM marks a shift of IT from largely focusing its resources and skills on the enterprise's operations to what really matters most — the customer relationship. Get it right and there's no bigger contribution IT could make to "business payoff." Get it wrong and you've made as big a contribution to "business problem." ▶

**Go back and review what happened in your ERP ventures.**



Keen (peter@peterkeen.com) is chairman of Keen Education in Fairfax Station, Va. His new book, *The eProcess Edge* (written with Mark McDonald), is co-published by Computerworld.



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I am the language that articulated  
the car you're driving,  
shirt you're wearing,  
book you're reading,  
film you're watching,  
product you're selling,  
paycheck you're earning,  
and swordfish you'll have  
at that restaurant tomorrow.  
I am the lynchpin under all  
the world's commerce.

***Who is the lynchpin under me?***

We're investing 6 billion dollars in the most far-reaching deployment of broadband out there. We're one of the largest network integrators, and a provider of advanced, global eCommerce solutions. We're SBC. The combined strengths of Ameritech, Pacific Bell, Southwestern Bell, Nevada Bell, SNET and now Sterling Commerce.



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# Christmas in July

**E-retailers and their click-and-mortar rivals try to apply lessons learned from last year's online holiday shopping fiascoes. By Julia King**

WO SHORT WEEKS BEFORE Christmas last year, San Francisco-based Egreetings Network Inc. added a small selection of digital gift certificates to its Web site, [www.egreetings.com](http://www.egreetings.com).

The certificates — which were redeemable with three different online merchants — were more or less an afterthought, like a last-minute stocking stuffer.

Since Egreetings had just developed its online gift center and the commerce portion of its Web site, it wasn't banking on a big Christmas selling season.

**BIG MISTAKE.** Online shoppers actually preferred buying and sending digital IOUs to having truffles and teddy bears dispatched to the doorsteps of their loved ones, Egreetings learned.

"We were surprised by how much more they wanted digital gifts than real ones," says Nicole Bohm, the company's former director of e-commerce. "Our actual results were 10 to 20 times higher than what we projected for digital gifting."

With the start of this year's holiday shopping siege still four months away, pure-play and hybrid retailers alike are hell-bent on avoiding a repeat of last year's well-publicized electronic-retailing fiascoes. Case in point: Toys R Us Inc.'s eleventh-hour "we're sorry" memo to customers whose early December orders didn't arrive in time for last Christmas. (See "Holiday Lessons," page 42.)

But Toys R Us was by no means alone. Among the dot-coms, a lack of real-world experience in operations, marketing and administration left many online shoppers complaining about out-of-stock notices, late or nonexistent deliveries and excruciating returns processes. In all, 40% of online shoppers in the U.S. reported problems with online stores during the preholiday shopping season last year (see chart).

This year, the stakes are even higher, with the online retail market projected to grow to \$61 billion in revenues. That's an 85% jump from the \$33 billion that online merchants raked in last year, according to The Boston Consulting Group.

"While some online retailers have

had to revisit their business plans and revenue models simply to remain in the game, others have shown tremendous revenue growth," says Donna Iucolano, chairwoman of an Internet shopping research committee at Shop.org, a trade association whose 400 members are exclusively Internet retailers.

#### Digital Coal

Last year, Internet customers' biggest holiday shopping complaints were about retailing fundamentals, like finding the products they wanted.

According to a survey of 541 online shoppers polled by Chicago-based Andersen Consulting between Dec. 27, 1999, and Jan. 3, 2000, nearly two-thirds of those who reported problems with online stores cited out-of-stock items as their biggest headache. Delivery problems and slow shipping costs ranked second and third, respectively, on cybershoppers' gripe sheets, followed by difficulties connecting to shopping Web sites during the holiday rush.

Greetings is hoping to address virtually all of these issues with a major information technology infrastructure overhaul that includes migrating from a two-tier to a multilayer computing architecture.

Greetings' chief technology officer, Behrooz Arbab, says the new multilayer computing infrastructure should significantly boost site performance and speed. That's because the new infrastructure allows different functions, such as displaying product images and checking inventory levels in real time, to occur simultaneously without creating a huge drag on the Web site's central database.

The infrastructure upgrade fully integrates the front end of the Web site, where online shoppers place their orders, with a back-end database containing inventory information. It also allows Arbab's team to track inventory levels in real time and push new images of available items to the site as other products sell out, thus dealing with the problem of stock shortages.

Greetings will also be offering digital certificates redeemable at 27 additional online retail partners such as Godiva Chocolatier Inc. in New York and FTD.com in Downers Grove, Ill. The company's strategy is to partner only with what Bohn calls "category killers," or retailers that dominate specific niches.

#### Back to Santa's Workshop

Meanwhile, New York-based SupremeVideo.com plans to participate in its third online holiday shopping season. It will be selling a full line of consumer electronic products, including 36-inch rear-projection television sets, video cameras and MP3 players. But it'll be doing so under the new name of Etronics.com and from a revamped Web site

that includes more categories of products, especially digital players and other audio devices.

"Etronics is more Web-sounding," Executive Vice President Alex Rivera says of the company's name change. "We found SupremeVideo too limiting in its appeal. People thought we were just a video-camera store."

Yet it's the giant TV sets that are one of the company's biggest holiday sellers. Last year, the company shipped 50 to 100 sets per week during the holiday rush. Unfortunately, too many of them were subsequently returned because of damages that occurred during shipping. The costs of the returns, says Rivera, slashed nearly half the profit off each TV set that was sold.

He estimates that 70% to 75% of all returns made last year due to late shipping or damaged products involved big-screen TVs.

That resulted in not only highly agitated customers, but also the guaranteed loss of future business from big-ticket buyers, Rivera says.

"People come back to buy higher-ticket items than their confidence increases. It's the repeat customers that are your bread and butter," he says.

But according to the results of postholiday surveys, most customers won't ever come back, which means not only the loss of the customer, but also the loss of all the money spent on marketing and advertising to acquire them in the first place.

Last year, the average per-customer acquisition cost across all channels jumped by 15%, to \$38, according to Shop.org. Pure-play retailers drove the increase, spending an average of \$82 per customer. Those figures jumped even higher during the holidays, to the tune of \$108 per customer.

This year, Etronics has switched delivery companies, contracting shipments of its largest pieces of merchandise to Nationstreet Inc., a Wethersfield, Mass.-based logistics and transportation company that specializes in the so-called last mile of deliveries.

Nationstreet doesn't just deliver a big-screen TV to a customer's doorstep. It crates it, sets it up in the living room — even programs the channels for the customer — and then hauls away the packaging.

"One of the most important attributes of our Web site is to deliver a product when you say you will and deliver it in good condition," Rivera says of the change.

With Nationstreet as Etronics' carrier, customers can also track the progress of their shipments on the Web.

By the time this year's holiday shopping begins in earnest, that tracking capability will be made seamless, enabling customers to retrieve their shipping data without ever leaving the Etronics Web site, says Rivera.

Cathy Pringle, vice president of marketing at Fort Worth, Texas-based Bomby Co., says the \$391 million furniture retailer will laser-focus on what she calls "the fundamentals" this holiday shopping season.

"If you can't deliver product to customers' expectations, it doesn't matter if you have three-dimensional, rotating products, alternate colors and live chat rooms on your Web site. It's ultimately about getting the product into customers' hands," says Pringle, whose company sells its furniture online, through catalogs and at more than 400 stores.

Bomby has been selling online since 1997, and with three holiday shopping seasons under its belt, says Pringle, "the name of the game really is fulfillment."

Bomby's goal last year was "to cut through the clutter" of frequently confusing and obnoxious messages from hordes of dot-com retailers with a clear and simple integrated marketing program. What it boils down to is that shoppers can buy, check on, return or pay for merchandise wherever they choose. If they buy a lamp online, they can pick it up and return it at one of Bomby's brick-and-mortar outlets.

But according to customer feedback, last year Bomby didn't fully grasp online shoppers' desire for customized services and little extras such as engraving and gift-wrapping services. Those services will be added to the Web site in time for this year's holiday season.

"If there was one thing we missed, it was the need for adjunct services," Pringle says. "Our site really focuses on fundamentals, and some of those extras would have been a help to our [online] customers."

#### Sitting This One Out

One thing all retailers seem to agree on is that a single bad shopping experience pretty much sours a customer forever. Online shoppers, it appears, aren't terribly forgiving. Instead, they'll simply click to another site.

That's one big reason why Seattle-based Body Shop Digital, the three-month-old online arm of the U.K.-based cosmetics retailer, is skipping this Christmas altogether. Instead, it will launch its online commerce operations sometime early next year.

"We're not willing to risk losing our customers for what would amount to \$2 million to \$3 million during the Christmas season," says Andy Sack, CEO of the new online unit.

"Looking at the carnage from last Christmas online, with the customers complaining about e-commerce, we decided the push would not have been worth it," Sack says. "It would have been a stretch for the organization, and inevitably, things would have fallen through the cracks." ▶

#### Top Problems Experienced By Internet Buyers

Gift sought was out of stock	64%
Product wasn't delivered on time	40%
Paid too much for delivery of the product	38%
Connection or download trouble	36%
Didn't receive confirmation or status report on purchase	28%
Selections were limited	27%
Web site was too difficult to navigate	26%
Web site didn't provide information needed to make purchase	25%
Prices weren't competitive	22%
Web site didn't offer enough gift ideas	16%

Source: Survey of 541 online shoppers (excluding 200 self-employed)

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# A GUY IS SITTING AT HIS CUBICLE WHEN THE HAMMER DROPS.

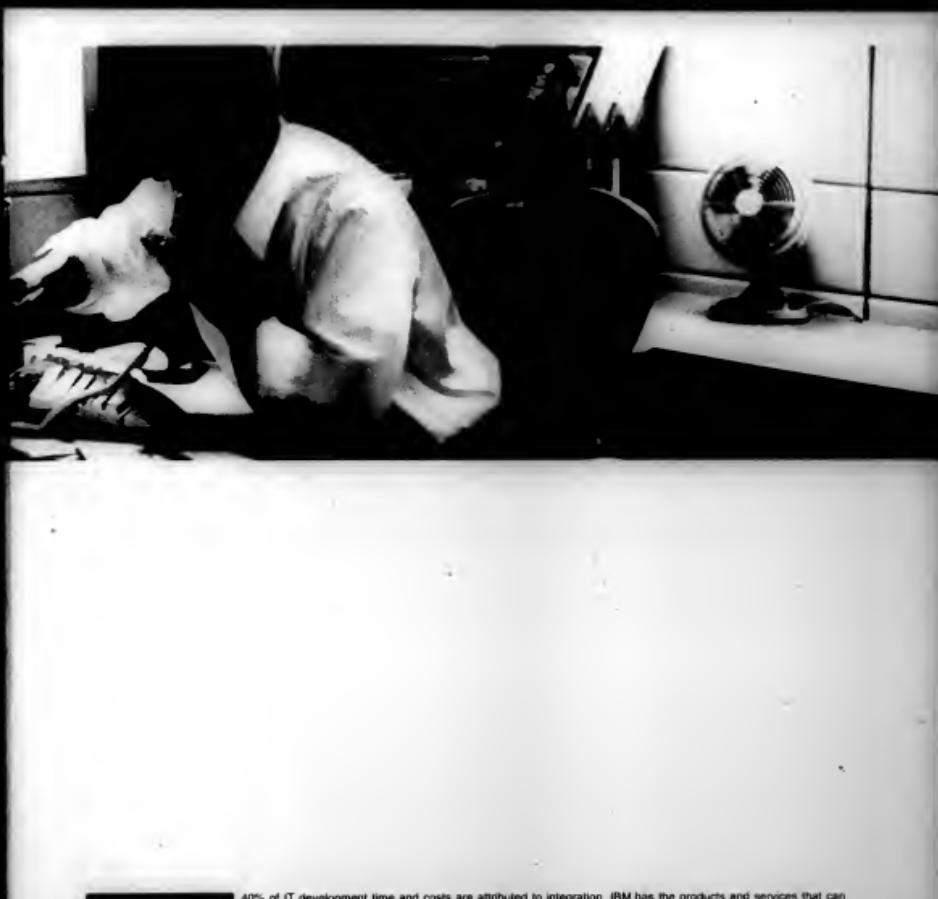
First, his pager starts to beep. Then his cell phone vibrates. The phone on his desk lights up. Then the second pager. The second phone. Before he can answer the first page, his third pager erupts.

Two dot.coms have merged, and the servers from dot.com one are shutting down the servers from dot.com two. The databases aren't talking, and the bridge didn't work. It just didn't.

His part in all this? He's a Webmaster who was last week promoted to IT director.

THAT'S WHEN IT HITS YOU. YOU ARE SO READY FOR





>>fact

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# Holiday Lessons

**Toysrus.com** was one of the most visible online retailers that encountered glitches during last year's holiday season. The week before Christmas, the Woodcliff Lake, N.J.-based retailer recognized that it wouldn't be able to fulfill online orders in time for the holiday and mailed \$100 gift certificates to affected customers — but still got lambasted by disgruntled shoppers, the press and analysts.

Toysrus.com CEO **John Barbour** has been busy since then beefing up his company's staffing, infrastructure and fulfillment operations while establishing biannual operations in preparation for this year's holiday onslaught. He recently talked with Computerworld's Carol Sliwa about his company's past experiences and ongoing preparations.

**What lessons did you learn from selling online during last year's holiday season?** We learned that you need to have a very robust infrastructure to handle this business and the scale of it. One of the things people don't realize is that most of these internet businesses, including ourselves, are having to grow infrastructure at a dramatic rate. Companies are increasing tenfold within a space of a year, two years. And that's incredibly tough to manage, no matter who you are.

**Can you discuss the difficulties in shipping orders during the holiday season?** We had bought someone else's fulfillment center in Memphis. It was an old Genesis Direct fulfillment center. Genesis Direct was a mail-order catalog business for sporting goods. We'd had a number of people go in and look at the place and start to get it tuned for the toy business, vs apparel and sporting goods, which are just dramatically different businesses. As you can imagine, in

## WHO IS HE?

**John Barbour**, 41, CEO of Toysrus.com, is a native of Scotland who has 16 years of experience in the toy and children's goods industry. He joined Toysrus.com last August after overseeing three entrepreneurial divisions at Pawtucket, R.I.-based Hasbro Inc.

apparel, you can put 50 shirts in a [certain] space, but you could only put maybe three Sega Dreamcasts.

About the week before the holidays, we found that the capacity of the warehouse wasn't what everyone had expected it to be, and we found there was a certain number of orders that we weren't able to ship in time for the holidays.

We made the decision at that time to contact those customers and send them Toys R Us vouchers worth \$100. The average value of the order was about \$60 to \$65, but our feeling was: How would we expect to be treated?

Now we get totally slammed in the marketplace for doing it and not being able to ship the

orders. As the dust settled in January, everyone kind of woke up to the fact that we were in very wide company.

**What have you done to prepare for the upcoming holiday season?** We have a new operating system application [the latest version of Allaire Corp.'s ColdFusion] that we reckon can handle, using the same servers, about three- to fourfold the traffic per server this year than we could handle last year.

And we've appointed MarchFirst, a big Internet design and technology business, [to] literally go through all of our technology and monitor the robustness of it and give recommendations of the bits that we have to improve and change.

The next stage is fulfillment. We have virtually quadrupled [our] fulfillment capacity for this holiday season. Last year, we had Memphis. Now we understand what toy fulfillment's about. We're investing in that facility, which will have a dramatic impact on the capacity of that center. We're opening a center near Ontario, Calif., and one in Chambersburg, Pa. And we will have just under 2 million square feet of fulfillment [space] for this holiday season [compared with 440,000 to 500,000 square feet of space last year]. I can tell you now, if our business increases twentyfold this year, we're not going to be able to handle it. Sadly, that's a fact of life. We can grow facilities and everything else that fast. But we have built in a significant increase based upon where we were this year.

The other thing we're doing is looking at our whole customer service infrastructure and our e-mail and telephone responses. We're developing a whole program to extend and enhance the information available to our customers. We're looking at that right from Stage 1 on the front end, so people can get information easier right through [to tracing] what's happening with an order.

**Do you know when you see online retailers such as Toysrus.com fail?** If you understand why they went out of business and you rationalize it, then, no, you don't feel scared about it in the slightest. The reality is, we're not in the same game as they're in. We've got the brand. We've got the bricks and mortar. We've got the assets. We've got the buying power. ♦

“

We learned that you need to have a very robust infrastructure to handle this business and the scale of it.

JOHN BARBOUR, CEO, TOYSRUS.COM



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# MIS Big Major On Campus

While enrollments for traditional computer science degrees are slightly on the rebound, those for MIS programs are through the roof, with many schools reporting 300% enrollment growth. By Leslie Goff

**S**TUDENTS ARE SITTING ON the floors of overcrowded classrooms in the management science and information technology degree program at Virginia Polytechnic Institute's Pamplin College of Business. So many students want to get into the programs that the department had to raise the required grade point average for transfers.

Enrollment swelled to 850 students this past year, up 132.9% from the 1995-96 enrollment of 365, and up 216% from 1990-91's 269 students.

Similar enrollment increases in the MIS degree program at the Red McCombs School of Business at the University of Texas at Austin have so overwhelmed administrators that they've drafted legislation to limit the number of new students entering the program. It accommodated 630 students this year — 238.9% more than the 180 who were enrolled in 1996-97, and 342% more than 1990-91's 138 undergraduates.

Universities may not be churning out enough information technology graduates to meet the demand — yet — but it's not for a lack of applicants. The surges in enrollment in the business schools at Blacksburg, Va.-based Virginia Tech and UT illustrate an overlooked story in the debate over whether universities are producing sufficient numbers of graduates to sustain the IT employment market.

The peaks and valleys in computer science programs receive the lion's share of attention in countless analyses of the IT supply-and-demand gap. But the enrollment growth in business school MIS and computer information systems (CIS) degree programs over the past five years has been nothing short of stellar.

Students are being enticed by reports of high starting salaries, a near guarantee of immediate employment after graduation and a new level of prestige surrounding the IT profession. And students who may not be willing to slog through the mathematical course work of computer science programs are signing up for business school IT programs in droves.

"There's a certain glamour in IT now; it's the glamour of the dot-com," says Eleanor Jordan, MIS area faculty chairwoman in the management sciences and information systems department at the Red McCombs School of Business. "A lot of kids are attracted to the major because they hear about the great job offers and the high salaries."

At the Carlson School of Management at the University of Minnesota at Minneapolis, which established a formal MIS degree only four years ago, enrollment has already reached maximum capacity, says David Naumann, an associate professor in the

information and decision sciences department. "It's really clear that young people understand that the economy is driven by technology, and if they want a career, they better know something about it," he says.

Before the university established the bachelor of business administration in MIS degree in the fall of 1996, Carlson's students could obtain a general business degree with a concentration in MIS course work.

In the first half of the '90s, fewer than 30 students per year pursued the self-designed degree. This May, the program graduated 87 students — an upsurge of more than 190% since the major was established.

The numbers of degree recipients are similarly up in Virginia Tech's and UT's programs — up by 184.3%, from 102 in 1990-91 to 190 in 1998-99, from 1990-91 to 236 in 1998-99, at UT.

The upsurges at the three business schools mirror a national trend revealed in an analysis of data from the National Center for Education Statistics (NCES) in Washington. In the 1996-97 academic year (the last for which data is available), universities awarded 7,048 IT-related bachelor's in business degrees, 102.8% more than the 3,474 MIS and CIS degrees conferred in the 1990-91 academic year.

So, why all the fuss about a lack of interest in IT programs? It derives partly from the three-year lag in reporting by the NCES, the leading statistics gatherer on university enrollments and graduates, and partly from the fact that more data is available on computer science programs than on business school IT programs. That's because computer science programs are still the far larger of the two.

For example, a respected study on IT degree production, the Taulbee Survey, conducted by the Computing Research Association (CRA) in Washington, focuses on computer science and engineering programs in Ph.D.-granting institutions. And a much-touted report released last summer by the U.S. Department of Commerce, "The Digital Work Force: Building InfoTech Skills at the Speed of Innovation," also concentrated on enrollment trends in computer science and engineering programs.

So even though NCES data indicates that degree production by business school IT programs rose steadily throughout the last decade, that increase was overshadowed by the fact that computer science programs dipped in the late '80s and early '90s.

A reversal in computer science enrollment trends only starts to reveal itself in the 1996-97 NCES data, which was released in October.

"There was a decline [in computer science], a cycle where enrollments

# BUSINESS CAREERS

went up and down," says Dennis Kafura, head of the computer science department at Virginia Tech's College of Arts and Sciences. "But ever since '95, we've been on the upswing. We've grown 200% in the last five years. We had hit bottom and started coming back up." Computer science is now the largest major at the university, he adds.

Nationally, bachelor's degrees in computer science dropped just 3.9% between 1990-91 and 1995-96 — the decade's low point — from 25,083 to

24,998, according to the NCEES. And 1996-97's 24,708 computer science degree marked an upturn of 2.8% over 1995-96. More recent data from the CRA and the Commerce Department confirms the reversal, as does anecdotal reporting by schools.

So overall, the news for the IT market is good: Computer science programs are exhibiting solid, double-digit-percentage enrollment growth, and business school programs are growing even faster, according to the NCEES de-

gree data and enrollment numbers reported by Virginia Tech, UT, the University of Minnesota and Arizona State University in Tempe.

The biggest effect the growth appears to be having on the IT labor market is that it's giving employers hope of more to come. Businesses have done a good job of working closely with schools to ensure that students are graduating with the skills the market needs. But the number of graduates hardly comes close to meeting demand.

"The market we see our students go to most is the area from Richmond [Va.] to Washington, D.C. And they say there are 20,000 vacant IT jobs in Washington alone," says Bernard Taylor, head of the management science and information technology department at the Pamplin College of Business. "So even if all of our graduates went there, that would be a drop in the bucket."

Goff is a freelance writer in New York.

## **Virginia Tech** Blacksburg, Va. Business school program

The Pamplin College of Business' department of management science and information technology (MS&IT) offers a bachelor's in MS&IT with a concentration in decision-support systems (DSS) or production and operations management (POM); the accounting department also offers a hybrid bachelor's in accounting and information systems.

[www.acct.vt.edu/](http://www.acct.vt.edu/)

Job placement rate (class of 1998): 85%, based on 101 students reporting.

Average starting salary (class of 1998): \$40,574, based on 100 students reporting.

Demand for the major: Since changing the name of the program from management sciences to MS&IT, demand has skyrocketed, says Bernard Taylor, head of the department.

Enrollment avg.: None.

Program: The DSS track is focused on systems analysis and development; the POM track is focused on operational issues such as inventory management and control. About 50% of students choose the DSS track. A third track is being created for e-commerce technology.

Curriculum: Required courses for the DSS track include database management and networks and telecommunications. All course work is honor-oriented and based around real-world projects.

Most popular courses: Object-oriented programming systems development (Java), advanced networking, e-commerce systems.

## **University of Minnesota** Minneapolis Business school IT program

The information and decision sciences department at the Carlson School of Management offers a bachelor's of science degree in business in MIS. [www.mis.umn.edu/~WWWPages/MSIS/MSISprogram.htm](http://www.mis.umn.edu/~WWWPages/MSIS/MSISprogram.htm)

Job placement rate (class of 1998): Not available; less than half of all graduates reported back, according to the office of career services.

Average starting salary (class of 1998): \$42,750, based on 56 job offers made to 35 students.

Demand for the major: Approximately 25% of Carlson students major in MIS.

Enrollment avg.: Approximately 100 students are admitted per year. "Our application rate is quite high, and we have to turn away many qualified students because of our enrollment cap," says David Hwang, an associate professor.

Program: Freshmen and sophomores must take required courses; MIS course work is chosen in the first two years.

Curriculum: The program is project-oriented, emphasizing object-oriented applications development, computer-aided software engineering tools, distributed systems, process modeling and project management.

Most popular courses: "Anything with 'e-commerce' in the title," says Hwang. "The whole cluster of Internet, Intranet and extranet is very popular. And database courses also; students recognize they're not as glamorous but they're really important."

## **University of Texas** Austin, Tex. Business school program

The management sciences and information systems department at the Ross McCallie School of Business offers a bachelor of business administration degree in MIS. [www.bsa.utexas.edu/faculty/](http://www.bsa.utexas.edu/faculty/)

Job placement rate (class of 1998): Approximately 90%.

Average starting salary (class of 2000): \$44,200, based on 57 students reporting; 95% also got a cash bonus.

Demand for the major: 24% of students at the Ross McCallie School of Business choose the MIS major but were not the top 40% a decade ago. "We've had the MIS major grow steadily over the last 10 years, and we're having more [non-business-track] students than we have in the past," says Damon Jordan, MIS area faculty chairwoman.

Enrollment avg.: None; but administrators have drafted legislation to limit the number of students admitted each year.

Program: Open enrollment for students accepted into the business school.

Curriculum: It includes project- and team-oriented hands-on course work, with an emphasis on real-world projects.

Most popular courses: Java; advanced data communications, including e-commerce-related work; systems analysis and design and project management, where students break into teams and work on projects for actual clients such as IBM, Electronic Data Systems Corp. and the City of Austin EMS agency. The latter class covers Microsoft Access, Visual Basic and Active Server Pages.

## **Arizona State University** Tempe, Ariz. Business school program

The School of Accountancy and Information Management at the College of Business offers a bachelor of science degree in computer information systems.

[www.acct.asu.edu/facts/](http://www.acct.asu.edu/facts/)

Job placement rate (class of 2000): 82%; based on 37 students reporting by May 5.

Average starting salary (class of 2000): \$48,200, based on 37 students reporting.

Demand for the major: Applications have doubled in the past five years, averaging approximately 300 per year, says Bob St. Louis, managing director of the school. "We used to accept about 80% of the applicants. Today, we accept about 40%," he adds.

Enrollment avg.: 130 students per year. Program: Students enroll in the College of Business but don't enter the major until their junior year.

Curriculum: It includes project- and team-oriented applications development, with an emphasis on how the three pieces interact. Through an off-campus practice major, students pursue such as SAP AG, J.D. Edwards & Co., Oracle Corp. and Microsoft Corp., provide free software for use in class projects.

Most popular courses: "One they like best is called 'E-Commerce,' which focuses on how to enable databases to be accessed over the Web — how do you set it up so people can actually do business over the Net?" St. Louis says.



# Globalization

BY JENNIFER D'ABARATO

**F**OR THOSE WHO THINK globalization means having a Web site that millions of people across the planet can access, go to Nikefootball.com.

You won't find Cowboys quarterback Troy Aikman.

Instead, the Nike Inc. site is populated by the Geoforce, a group of today's hottest European soccer (or "football," as they say overseas) players.

"If you're talking about football in Europe, you're not talking about Dallas Sanders. You're talking about [Dutch soccer player] Edgar Davids," says Nikefootball.com spokeswoman Monica Rigali.

While Americans may expect to find NFL draft prospects on a site called Nikefootball.com, the Beaverton, Ore.-based sportswear maker recognized that there is a bigger market beyond these shores for which football is an entirely different animal.

Nike already has a site intended for an American audience—Nike.com. The Nikefootball.com site was created specifically so Nike can capitalize on the popularity of the Euro 2000 soccer championships, explains Rigali.

Nike's online use of the term football to attract European and Latin American sports fans is indicative of just how important globalization marketing outside one's home country — is to U.S. businesses. As the online population continues to expand beyond U.S. shores, more companies are moving to globalize their e-commerce strategies.

Recent studies conducted by Framingham, Mass.-based International Data Corp. and the Computer Industry Almanac estimate that Americans will shrink to one-third of all online users by 2003. The U.S. now accounts for less than half the Web population.

Given the numbers, most analysts say companies have no choice but to develop globalization strategies, whether that

## DEFINITION

**Globalization:** Marketing and selling a product outside a company's home country. To successfully do that on the Internet, a company needs to localize, or make its Web site linguistically, culturally and in all other ways accessible to customers outside its home territory. That also means accommodating differences in local laws, currencies and delivery options.

### AT A GLANCE

#### Steps for devising a globalization strategy:

- Register name at worldwide domains
- Hire local support staff
- Use appropriate level of technology
- Use local payment systems
- Set up appropriate delivery systems

means defending a brand name or actively trying to penetrate a foreign market.

How to do that is the next big question.

### Just Do It

While the world is as close as the click of a mouse, there are still cultural and linguistic gaffs that make interacting over the Internet as challenging as cross-continental flights were to the Wright brothers.

When considering how much to invest in globalization — that is, how much any foreign market is worth to your company — you need to devise a strategy, according to Preston Dodd, an analyst at New York-based Jupiter Communications Inc.

That strategy should address issues such as registering a brand as a domain to protect it from worldwide predators, es-

tablishing Web sites with locally based support staff to provide appropriate cultural content and establishing the means to take orders and deliver them.

Charles Baxter, president and CEO of iTranslate Inc. in San Francisco, says that if a company decides to pursue market penetration, it should do so with local partners to ensure that the content is appropriate and targeted to the local audience. But those partners should also have a strong guiding vision from the parent company so brand identity and other key business practices aren't lost in the translation.

"The company knows its business," Baxter says.

Another key to building an e-commerce plan for foreign sites is to keep in mind the technology of the user, he says.

In Europe, Internet access via cellular phones is hugely popular, he says. Therefore, when designing a page for those customers, developers should be minimalist with their real estate. It's OK for desktop users if sites are somewhat cluttered, Baxter says, but for on-the-go wireless surfers, minimal content is a must.

Also, companies need to

study how consumers pay for goods. In Japan, for example, credit cards are rare; postal workers routinely collect payment for goods delivered.

Another consideration is shipping capability, says Baxter. You can have the site built by local developers and you can have the ability to legally accept any kind of foreign payment, but can you deliver? In China, for example, many remote villages don't even have telephones, much less modern postal services.

Wireless may solve the infrastructure problem with regard to access, Baxter says. But there is still a disconnect when the only form of transportation is an ox and a dirt path.

### Going Global

For Nike, there was no question: soccer fans represent a large market, and it was well worth the effort to attract them, says Nikefootball.com's Rigali. The Web site is available in English, French, Spanish,

Italian, Swedish, German, Portuguese and Dutch.

But while Nike has been successful in its globalization plans, it has had a hard time defending its internationally recognized brand name in the global market, according to Dodd.

For example, though Nikefootball.com has content in Italian, Nike.it (it is the Italian equivalent of .com) is a site for an Italian company called Nike S.r.l., which does surface treatments on glass bulbs for electric lights.

But, like other companies, Nike is learning quickly.

While early Internet use spread U.S. culture around the globe, Baxter says he sees a different future.

"I actually think that in the long term it's going to make Americans more international," he says. ■

### MORE THIS ISSUE

For a look at the technology behind Web site globalization, see page 56.

## Pieces of Eight

Nikefootball.com was developed and marketed for European football fans in the midst of the mania for the Euro 2000 soccer championships. Nikefootball.com is available in eight European languages, including the four shown here: English, French, Portuguese and German (clockwise from upper left).



JOE AUER/DRIVING THE DEAL

# Is it your software? Or the outsourcer's?

**T**HINKING OF OUTSOURCING? One of the first things you should consider is your software. Whether you own or license your current software, the rights and obligations issues are of huge importance when moving into an outsourcing deal.

There are two basic approaches. First, you can transfer your interest in the software to the outsourcer. Or you can allow the outsourcer to use the software on your behalf. Either works. The key to success is understanding which approach to use and when.

If you transfer your license or ownership rights to the outsourcer, you may pay a lot to get those rights back if you insure later. If you let the outsourcer use the software, you retain all the responsibilities you have now. The approach you choose may be dictated, to a large degree, by the license agreements you have in place.

Many software suppliers let you give an outsourcer only use of the software, leaving you responsible for all license agreement terms. The benefit is that it's easier to regain control over the software at a later date. The downside: you don't off-load the license obligations and risk to the outsourcer.

But some software suppliers will allow you to transfer your license rights directly to an outsourcer. Usually, the outsourcer must agree to live up to the terms of your license. Later, should you decide to insure, you have to relicense the software unless you're careful to make sure in the contract with the supplier that the transfer to an outsourcer could be reversed.

A few tips: Your software licenses can become complex and expensive to deal with when outsourcing, so make sure the licenses you're negotiating have appropriate flexibilities for any future outsourcing deals.

Also, the larger out-

sourcers have license agreements in place with many software suppliers. During the evaluation phase of any outsourcing deal, you should find out what the outsourcer's relationships are with your software provider and determine whether it's better to use the outsourcer's license or yours.

Don't forget that both the software supplier and outsourcer are lying awake at night trying to think about ways to maximize their profits — at your expense.

## Think 'Results,' Not 'Resources'

Buyers should beware of form contract clauses that subtly relieve the vendor of any performance obligation.

tions, especially the obligation to provide the results the customer needs — and should expect. Many times, lawyers for slippery suppliers do this by obligating the supplier to provide only "resources," not "results." The main — and massive — difference between a "results" or "resources" deal is which party is responsible for the outcome; the customer is responsible in a resources deal, while the supplier is in a results deal.

For example, a customer was doing a Web-hosting deal. The supplier agreed to provide services, including data entry and account management. Specifically, the contract stated that the supplier would "provide sufficient resources" to fulfill its obligations. The services weren't clearly defined, and there were no measurements of quality or time frames related to the supplier's performance. There were no service levels, no definition of account management or descriptions of

results of any sort. In other words, the supplier would provide the resources it deemed sufficient to fulfill any undefined obligations. Most disputes in IT deals are based on interpretations of what was to have been done and whose responsibility it was. Disputes would have plagued this deal from Day 1.

Once the customer caught the significant shortcomings of the contract, improvements were made. Service descriptions were clearly defined. Service levels for performance measurement were added. The supplier was held responsible for the results. Remedies for the supplier's failure to meet service levels were included. Both the customer and supplier had a clearer understanding of their respective obligations. The deal and the relationship now had a better chance of succeeding.

Don't forget: Clarity, measurement and remedies are keys to success. ■



**Joe Auer** is president of International Computer Negotiations Inc. (www.internetcash.com), a Winter Park, Fla., consultancy that advises users on high-tech procurement. ICM also runs the Association of High-Tech Acquisition Professionals. Contact him at [jauer@internetcash.com](mailto:jauer@internetcash.com).

## BRIEFS

### Study: German Dot-coms Hurting

One in seven German Internet companies risks running out of money within the next two years, according to a new study by New York-based research and consulting firm PriceWaterhouseCoopers. The study analyzed 56 publicly traded German companies. It was based on data available as of the end of last year, said study co-author Thomas Schmidt. Among those on the endangered list are business-to-consumer companies and software companies that help other businesses sell on the Web. Companies involved in three other Internet business sectors that were analyzed — infra-

structure, multimedia and search engines — are less at risk, according to the authors.

### Feds to Probe NTT's Takeover of Verio

Under the authority of legislation usually invoked to address national security concerns, the U.S. government will probe Tokyo-based NTT Communications' proposed acquisition of Internet hosting and service provider Verio Inc. in Englewood, Colo., NTT said last week. The Committee on Foreign Investment in the United States will investigate "any anticompetitive matters that relate to the Internet industry," according to a statement from NTT. The investigation comes as the U.S. is about to enter what could be the final round of long-term negotiations on inter-

connection charges with NTT subsidiaries. The U.S. has threatened to file a complaint against Japan with the Geneva-based World Trade Organization over the issue.

### Dattek Launches Decimal Trading

Dattek Online Brokerage Services LLC introduced decimal trading July 3 on The Island ECN, Dattek's electronic communication network (ECN). Decimal trading will be available for stocks listed on Nasdaq. Investors currently trade in fractional increments, the smallest of which is one-thousandth of a dollar, or \$.25 cents. According to Dattek, the switch should give clients a competitive advantage in bidding — at least until other trading platforms catch up.

### Niku to Buy ABT

Niku Corp. in Redwood City, Calif., a vendor of Internet software for services companies, has entered into a definitive agreement to acquire ABT Corp., a New York-based vendor of project management software.

The decision grew out of a successful joint marketing partnership earlier this year. The acquisition will accelerate ABT's migration of its products to the Web, a Niku spokesman said.

### InternetCash Adds Spanish Section

InternetCash Corp. has launched a Spanish-language section of its Web site targeting U.S. Hispanics

and designed to let them shop online without a credit card.

Like the English-language section of [www.internetcash.com](http://www.internetcash.com), the new section offers the InternetCash prepaid card. Similar to a prepaid phone card, the card can be used as an alternative way to pay for goods online.

InternetCash says shoppers who use the card don't have to disclose personal information like they do when they use credit cards.

### Fighting Cybercrime

XPMG Consulting LLC's Forensic and Litigation Solutions recently released a report offering tips to prevent cybercrimes. "E-Commerce and Cyber Crime: New Strategies for Managing the Risks of Exploitation." The report is available online at [www.xpmg.com](http://www.xpmg.com).



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# TECHNOLOGY

## TOOLS AND TOYS

PC Expo was a showcase of new business and personal IT tools. It was also another indication that the world is going wireless even more quickly than most observers had imagined. Senior reviews editor Russell Kay offers his view on some of the new technology introduced at the expo. » **50**

## PASS THE DATA, PLEASE

Boeing has successfully tested an automated approach to sharing data between a legacy mainframe application and a newer, off-the-shelf product data management tool. The pilot showed that both applications could be updated without crashing virtual systems or writing a lot of code. » **52**

## BIG WHITE FROM BIG BLUE

IBM has announced its latest supercomputer, the ASCI White. The system is the most powerful supercomputer in the world, according to the company, and draws many of its technologies from today's commercially available RS/6000 systems. » **52**

## HACK OF THE MONTH

All those Napster-using employees in your company aren't just wasting time listening to music. They could be exposing corporate systems to a program that can disguise any files as MP3

files and download them without anybody knowing it. » **53**

## HANDS ON

Broadband access for telecommuters isn't all that hard to install and get up and running, as senior reviews editor Russell Kay discovers. Once you've got it, it's wonderful — but watch out for security exposure. » **54**

## QUICKSTUDY

When your Web site audience is the whole world, how do you make its content accessible to people who use different languages and have different cultural values and expectations? This week's QuickStudy takes a look at the Web site globalization process. » **55**

## FUTURE WATCH

Carbon nanotubes are microscopic graphite structures that are stronger than steel and lighter than plastic. They have already attracted a cult following among techies. The question is, will nanotubes replace silicon in electronic devices? » **57**

## THIN IS BETTER

Some corporate customers are quietly moving to thin clients. The reasons are what you'd expect: lower cost, easier manageability, better security. The surprise: Many of those thin clients look a lot like PCs. » **62**

### MORE

Emerging Companies ..... **60**  
Job Watch ..... **60**

## DREAMS OF TOTAL SECURITY

INFORMATION TECHNOLOGY MANAGERS are charged with protecting e-commerce from all things illegal — online credit-card heists, denial-of-service attacks, Web page destruction, viruses and data theft, to name a few. In order to succeed, IT managers must try to change the way their companies think about security and make it an integral part of the business process that provides distributed, real-time, flexible defenses.

**58**

## How It Should Be Done



## BRIEFS

### E-Commerce Driving Network Convergence

The big mover propelling network convergence is no longer voice applications, it's e-commerce, said a report released last month. According to the report from Sage Research Inc. in Natick, Mass., "more than 50% of U.S. organizations are planning to make significant changes to their [wide-area networks] in the next two years" to accommodate e-commerce-driven initiatives. Although only 10% of the 300 surveyed companies offer network access to their suppliers today, 42% will do so by the end of next year, the report said.

### Quantum Releases New NAS Products

**San Francisco-based Quantum Corp.'s Snap Division** introduced its server product line with three additions for the network-attached storage market. The Snap Server 1000 series features two models, one with 10GB in capacity that costs \$4995 and another with 30GB that costs \$7995. The Snap Server 2000 supports RAID levels 0 and 1 and has 60GB capacity. [www.quantum.com](http://www.quantum.com)

### Veritas Launches SANPoint Control

**Veritas Software Corp.** has announced SANPoint Control, software that provides centralized monitoring and control of all storage-area network (SAN) resources, such as logical volumes, Fibre Channel adapters and switches and peripheral devices. SANPoint Control will ship next month. San Francisco-based Veritas hasn't finalized pricing. [www.veritas.com](http://www.veritas.com)

### Intel Plans New Technology Centers

**Intel Corp.** is prepared to spend \$100 million over the next year to open 15 Intel Solution Centers worldwide. The purpose of the centers is to increase demand for Intel technologies like networking products, chips and motherboards.

# No Film, No Wires, No Fuss, No Foolin'

Newest line of dynamic digital cameras unveiled at PC Expo

BY RUSSELL KAY

**D**O YOU remember when Sony Corp. dominated the digital camera market with its Mavica, which recorded on a floppy disk? That era ended when camera images got so big that a floppy could hold only one or two. Well, as was evident at PC Expo in New York last month, Tokyo-based Sony is trying a similar strategy again, but with a nod to today's bigger image files. Sony's newest digital camera, the 2.1-megapixel MVC-CD100, captures images on a 3.5-in. recordable CD.

That's right, inside the camera is a mini CD-R drive. Each blank CD-R costs \$4 (for now) and holds 156MB. It's usable only once, but it's permanent, still a lot cheaper than most alternatives and requires no transfer to your PC; just stick the little disk into your PC's CD drive. The camera itself is well made but rather bulky, with a 10-times optical zoom, a bright LCD, Sony's image-stabilizing feature and a number of small things aimed at prolonging battery life, which Sony claims is

that let you upload a picture file for them to make a photographic quality print — anywhere from 4 by 6 in. to 20 by 30 in. and up. Prices are about the same as prints from film negatives, and the output quality can be exceptionally good.

Some of the many suppliers in the finishing business include EZ Prints Inc. ([www.ezprints.com](http://www.ezprints.com)), Ofoto Inc. ([www.ofoto.com](http://www.ofoto.com)) and Shutterfly.com ([www.shutterfly.com](http://www.shutterfly.com)). Olympus America Inc. in Melville, N.Y., was showing its new \$999 dye-sublimation photo printer, the P400. In addition to the usual connections, you could insert a SmartMedia card directly from your camera into the P400 and print without a PC. Quality was indistinguishable from the highest-quality traditional photographic output — the kind of print for which professionals were accustomed to paying hundreds of dollars each.

On the other hand, there's nothing much remarkable

about the attractive, boat-shaped unit has a silver top and features two or four pull-out, retractable RJ45 Ethernet cords on each side. A single 25-ft. cord carries both the network connection and power into the unit.

**Look Ma, No Wires**

Handheld and wireless were two of the biggest elements on display at PC Expo this year. From Wireless Application Protocol-enabled, multiprotocol cellular phones to wireless modems for personal digital assistants (PDA) and wireless LANs and WANs — even to a couple of Bluetooth products — everyone was trying to cut the cord. Unfortunately, there's still a lot of confusion and incompatibilities.

The technologist's dream of one handheld device that will replace your phone, PDA organizer, laptop, paper and e-mail receiver is still a dream. In fact, given the plethora of incompatible producers, the removable hardware design of the Handspring Inc. Visor is looking a lot more sensible. But we're still in the pioneering phase of wireless development, and there's bound to be a lot more innovation — and a lot more fallout.

In addition, Hitachi America Ltd., Sony, Fujitsu PC Corp. and others were showing a number of new sizes and types of handheld computers.

**Touch Me, Please**

San Jose-based Synaptics Inc., suppliers of digital touchpad technology used by many notebook makers, has come up with a new capacitive pointing-stick technology that reduces the number of components from 30 to 7, and none of them have to be on the motherboard. Better yet, if a notebook includes both touchpad and stick, the enhanced features of both can be active at the same time — for example, you could use the stick for cursor movement but the touchpad for scrolling. When this combo appears in a notebook, I may be tempted to give up taking an external mouse when I travel. ▶

THE XIRCOM NetStation

sufficient for taking 1,100 pictures. The camera is due to arrive next month at a street price of \$1,299.

#### But I Want Print!

Now that digital photography has caught on, many Internet-based services have emerged, from share-your-photos Web sites to services

about that today. Even the least expensive ink-jet printers produce astonishingly high-quality photographic color at speeds that are now beginning to rival those of color lasers. What brand? It hardly matters — sure, some are a little better than others, but between Epson America Inc., Canon Inc., Hewlett-

#### A Conference Room Appliance

Thousands of Calif.-based Xircom Inc. was showing its NetStation, essentially a networking hub designed specifically for conference rooms.





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## Boeing Tests Automated Data Tool

BY JAMES COPE

Moving data from legacy applications to commercial off-the-shelf software can disrupt operations. But software

engineers at The Boeing Co. in Seattle said recently that they have successfully tested a method that could make the process safe and seamless.

**Just a reminder that  
setting your expectations higher is  
new business as usual.**

**"With Microsoft  
Windows® 2000  
Professional, we  
don't have to reboot.  
It's reliable and, with  
100,000 users, it's  
going to make our  
jobs a lot easier."**

— Keith Postle, PC LAN Engineer,  
Wells Fargo Services Co.

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Greg Saul, chief systems architect at Boeing, said his developers conducted a four-week pilot program, which ended late last month, to simultaneously upgrade data in an IBM 3270 IMS database legacy system and in Metaphase, an application from Structural Dynamics Research Corp. (SDRC) in Milford, Ohio. Metaphase integrates product and manufacturing information and manufacturing information into a browser-accessible database.

The point of the test, according to Kurt Nelson, a senior systems architect at Boeing, was to see if Metaphase and the legacy application could be updated simultaneously without downtime on either system.

Boeing has a worthy goal, according to analyst Robyn Bergeron at Cahners In-Stat Group in Newton, Mass. "It's a lot of work to coordinate an IT department to write to both databases, so anything that smooths the process has value," Bergeron said.

Many firms have data and systems that go back 20 years, she added, and "it's nearly impossible for them to find the time to move data [manually]."

### Auto-integration

Rather than develop code from scratch that would link the systems, Saul and Nelson used Accelis, an automated development tool also from SDRC, to create a new application that integrates them.

Saul said there were three possible approaches. One was system-to-system

integration, in which Boeing would use Accelis to create an application that automatically moves data between the applications.

The second is what Saul calls "plug-and-play," in which Accelis is used to define broad functions in both applications — which involves data retrieval — and to make those functions available and understandable to either application.

Boeing chose a third approach, which Saul called "dual-system update from a browser," because of its speed and simplicity. With it, developers used Accelis to create an application with a browser interface that simultaneously, and from a single entry, sends data to both the legacy and newer, off-the-shelf application.

While the pilot was successful, Saul and Nelson still have a lot of work ahead of them. Boeing officials want to share data not only between the new product data management (PDM) systems and older applications, but also between the PDM system and enterprise resource planning applications from Baan Co. in Barneveld, Netherlands.

Saul said Boeing will eventually move some 400 legacy applications to off-the-shelf software. While declining to say if and when he would use Accelis, he said the pilot demonstrated that the transition can be made without disrupting business, shutting down critical applications or doing a lot of manual coding. ■

## Now, an RS/6000 Supercomputer

BY JAHKUMAR VIJAYAN

Users wondering about the scalability of their RS/6000 SP server architectures might want to take a look at last week's ASCI White supercomputer announcement from IBM.

Featuring 512 server nodes, 6 terabytes (TB) of memory and more than 120TB of storage, the system is the most powerful supercomputer in the world and draws many of its technologies from today's commercially available RS/6000 systems, according to IBM.

ASCI White will be used by the Lawrence Livermore National Laboratory in Livermore, Calif., to test nuclear weapons.

It's more than three times faster than the 3.8 teraflops systems delivered by IBM to Livermore Labs back in 1993 and more than 100 times faster than the chess-playing Deep Blue

supercomputer that beat Gary Kasparov in 1997, according to IBM. Put another way, it would take a human being with a calculator more than 10 million years to perform the number of operations ASCI White can do in one second, said IBM.

The system comprises 512 separate RS/6000 16-processor Unix servers linked to one another via a superfast switch capable of pumping data between the servers at 450G byte/sec. — compared with about 100G byte/sec. on the existing system, said Jim Jardine, IBM's ASCI program manager.

New load-balancing and parallelization software also significantly boost ASCI White's performance over the previous generation, Jardine said.

Users will be able to buy the same technology to run applications for such tasks as oil exploration, weather forecasting and online transaction processing. The largest commercial user of such a system is Charles Schwab & Co. in New York, which is using IBM's previous-generation supercomputer to power its financial applications, Jardine said. ■



BOEING'S GREG SAUL says the company's pilot project demonstrated that database transitions can be made without disruption

DEBORAH RADCLIFF/HACK OF THE MONTH

# Napster trap

**B**URED BEHIND the entertainment world vs. Napster battle is something so sinister, it's got the information security and law enforcement community all abuzz.

Many famous musicians are suing Napster Inc., claiming that its namesake software reduces their income because it allows undocumented and unregulated downloads of their music to PCs.

What's worse, Napster can be tricked into letting just about any data out of a user's desktop when combined with another "wrapping" program called Wrapster (<http://notachavian.tripod.com>).

Bruce Hubbert, director of West Coast operations at information security services firm IPsec Inc., calls this the ultimate Trojan horse (a program that's designed to appear as if it does one thing but performs a different function). Wrapster can make anything look like an MP3 file, which can then be remotely downloaded from a PC without the user noticing.

Anyone who has downloaded the Napster client is open to exploitation. Here's how it works.

## The Setup

Say Joe User goes to Napster's Web site ([www.napster.com](http://www.napster.com)) and downloads the free software that allows his machine to broadcast and retrieve MP3 files from the hard drives of other Napster users.

After Joe User submits a short online form, the Napster server will search his hard drive and upload a list of all MP3 files and even note the speed at which he's connected to the Web.

Now Joe User can get lists of all the song files stored on the hard drives of other Napster users. Joe User clicks on the song of his choice, which connects him to the PC of the owner of that song, and the direct download from PC to PC begins. Depending on bandwidth, Joe User could be downloading and uploading music to who knows how

many users at the same time.

Now assume Sinister Geek wants to pretend to pull MP3 files off Joe User's system, but he's really after financial information, passwords or customer lists.

## The Trap Closes

Sinister Geek downloads the latest version, 2.0, of Wrapster. He then logs on to Napster, gets a list of songs and borrows his way into the hard drive of his choice. But instead of music, Wrapster could help itself to anything — Word files, Excel spreadsheets, Visual Basic files, you name it. All it takes is knowledge of what types of files store sensitive data and a common knowledge of Windows file extensions (such as .xls for Excel, .vbs for Visual Basic scripting or .doc for Word files).

## Wrapped Files

"I can tell Wrapster to send me your marketing plan," says Hubbert, adding that he has done exactly that. "Wrapster wraps it up to look like an MP3 file, and Napster does the sending. There's no authentication of these downloads, which means no verification of what you're sending or to whom."

Secret Service agent Bob Weaver, who spearheads the Electronic Crimes Task Force in New York, says the group has been worried about this problem for several months but that it hasn't seen any actual incidents.

The Army's Computer Investigative Unit, which operates out of the Criminal Investigation Command in Fort Belvoir, Va., is also aware of the threat, but the lab hasn't yet found it in the wild.

Because the code behind these programs is open source and freely available on the Web, users of both

Napster and Wrapster are already creating variants of them.

That means that even if vendors of intrusion-detection systems profile an appropriate attack signature, the signatures are changing, making them pretty much impossible

for intrusion detection tools to detect.

So the best defense is to outlaw MP3 downloads on corporate computers and laptops. If employees still want music as they work, tell them to listen to the radio. ♦



DEBORAH RADCLIFF is a  
Computerworld features  
writer. Contact her at  
[deborah.radcliff@computerworld.com](mailto:deborah.radcliff@computerworld.com)

# The DSL Experience

Hallelujah! I've got broadband. By Russell Kay

**F**OR ALMOST TWO YEARS, I've had to listen to colleagues talk about the wonderful speed of cable-modem or Digital Subscriber Line (DSL) Internet access while I was poking along with a 56K bit/sec. modem. That was the best I could do. My cable company promised to offer service but said I'd have to wait more than a year. Periodically, I'd check to see if DSL service was available. But the answer kept coming up negative, and I'd resigned myself to my analog modem.

Then I got an e-mail message suggesting that I check again. Gloriaski — DSL right now? I opted to go with the least-expensive provider, New York-based Bell Atlantic Corp., my local phone company, and its Unispeed service. I'd heard all kinds of horror stories during the past year about Bell Atlantic's unfamiliarity and in-

aptness in delivering digital services and about hassles and delays in getting everything installed correctly. But I figured the company had had quite a while to work on it, and I took a chance to save a few hundred dollars. The ordering process over the phone went smoothly, and I was promised active service in three weeks. The in-

stall-it-yourself kit, including a Westell Technologies Inc. DSL modem, a 3Com Corp. PCI Ethernet card, an assortment of line filters, software and instructions (all for \$99), arrived in just three days. And wonder of wonders, in just a week from the time of my order, service was up and active. I connected the DSL modem, the Bell Atlantic and Wind River Systems Inc. software, filters for phones, and — there I was, connected to the Internet.

I'm paying \$50 per month for the least-expensive home service — 640K bit/sec. download (90K bit/sec. upload) — which includes an Internet service provider account with Bell Atlantic.net. That's almost exactly the same amount I've been paying for a second phone line (about \$30 per month) and my current Internet service provider (\$20 per month), and the improvement in performance is dramatic.

Using the bandwidth-testing utility at [www.2wire.com/slp/dlg\\_bandwidth.html](http://www.2wire.com/slp/dlg_bandwidth.html), I've seen connection speeds of up to 480K bit/sec., and that's faster than what I get from Computerworld's office LAN.

#### Security Concerns

But there's a dark side, too. Now I have to set up that network at home so I can easily provide Internet access to, and switch among, my home-based desktop, my Computerworld-issued notebook and my wife's computer. More urgently, I need to make sure personal files aren't vulnerable to outside damage or disclosure.

As a first step, I installed the software firewall ZoneAlert 2.1 from San Francisco-based ZoneLabs Inc. This program is free for personal and nonprofit use and just \$9.95 for business use.

Before and after the firewall implant, I checked how exposed my system was by using the ShieldsUp programs at Gibson Research Corp.'s Web site ([www.grc.com](http://www.grc.com)). The first time I tried these tests, I discovered that because of some earlier network settings, both my C and D drives were wide open to any passing intruder. I closed that hole in a hurry.

But I'm not fully convinced that a software-only firewall, without a separate intermediary host, can provide real protection. Over the next few



THIS WESTELL Asymmetric DSL modem attaches to a PC via an RJ45 network plug

months, I plan to test several of the new, inexpensive firewall/networking adapters designed for home and small-office DSL use.

One piece of hardware that has simplified home setup is a Universal Serial Bus (USB) Ethernet adapter. I've used several different brands, including Torrance, Calif.-based Trendware International Inc.'s TU-ET10 and TU-ET100, plus Vancouver, British Columbia-based F-mate Networks Inc.'s USB/Ethernet adapter. These adapters, some priced as low as \$40, are cheaper than a PCMCIA Ethernet card and even simpler to use.

When it came to configuring my laptop for DSL, the DSL software from Alameda, Calif.-based Wind River just wouldn't install, period. It kept insisting that I didn't have dial-up networking (DUN) installed in my Windows Millennium Edition (Beta version) operating system, even though I quite obviously did. A Bell Atlantic support technician spent nearly an hour with me on the phone, and the final fix turned out to be one of those things you learn to hate about Windows. I had to uninstall DUN, reboot, reinstall DUN and reboot again. Then the DSL software loaded without incident.

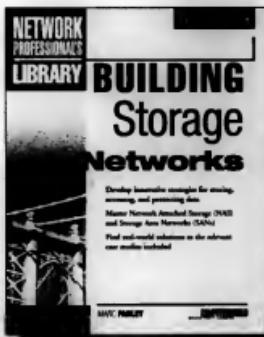
Speaking of fussy software, Bell Atlantic makes you install its own version of Netscape Navigator 4.5 in order to set up your new DSL account, even if you never use it again. But that was a small price to pay. DSL — it's wonderful.



TRENDWARE'S TrendNet USB Ethernet adapters are simple and affordable

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# Web Site Globalization

BY JENNIFER DiSABATINO

**F**OR THE E-BUSINESS that has decided to globalize, a number of unique technical issues spring up.

At first blush, many U.S. companies may think the only challenge to making a site accessible to foreign consumers is finding a good translator. That, experts say, is the least of their worries.

Charles Baxter, president and CEO of Extralane Inc. in San Francisco, and David Lawson, the company's chief technology officer, consult with a number of clients to help translate their Web sites for foreign markets.

"You [need] a strategy where you can have dynamic content flows," Lawson says. "You have to come up with a site that is language-neutral. You don't build it for the U.S. You build it for the world."

The biggest and most costly problem for companies, say Baxter and Lawson, is having to re-create Web sites from scratch because the original was programmed with English text embedded in the code and with applications that use English as a default.

"It can involve almost a complete rewrite of some products," Lawson says. "The general issue is that most of the technology has been developed in America, with an eye to English."

## Planning Ahead

Planning is the key, according to a globalization study conducted by New York-based Jupiter Communications Inc. "The technical evaluation phase should occur simultaneously with the planning and research, because significant portions of planning and budgets are contingent on such things as content management systems, server infrastructure and hosting decisions," wrote Jupiter analyst Preston Dodd in the February 1999 report.

Dodd suggests that the technical evaluation should take one to three months, depending on the complexity of the site.

There is an upside, however:

## DEFINITION

**Web site globalization** is the configuring of a company's Web site so it can be used to market and sell products outside its home country. It's critical that the site be customizable in a variety of ways, including linguistically and culturally, so it's accessible, understandable and inoffensive to customers in other parts of the world. This also means accommodating differences in local laws, currencies and delivery options.



Increasingly, software can handle differences in language.

"The more modern the technology, the less legacy involved in a project, the easier it is to work through," Baxter says.

One development that has made localization a lot easier is Unicode, a new font-mapping standard that can be used across many different languages. Unicode is based, in part, on double-byte code enabling.

Most text applications use a single 8-bit coding scheme to represent all the characters in Western alphabets. This allows

for 256 different characters or glyphs, which is more than enough for alphabetic systems, particularly those based on the Roman alphabet and all its variations.

For Asian languages such as Chinese and Japanese, however, written language isn't alphabetical in nature. It's based upon thousands of individual characters, far outstripping what any single-byte code can handle. That's where double-byte code enabling comes in. Font size matters, too. While

for a page in interchangeable units such as Java applets or JavaBeans.

To launch a new version of a site for Taiwan, for example, a developer could simply unplug an applet with Japanese text and insert another with the correct dialect of Chinese.

## Keeping Options Open

For those sites that need remedial work, Baxter says, there is some help. "Macro-media's new generator product is superb," he says. "It allows you to separate the text from the graphics." Leaving the site relatively clear helps in switching from a left-to-right layout (for most Western readers) to a right-to-left layout (for Arabic or Hebrew) or a vertical layout (for Chinese).

Even when you're thinking of just Western languages, it's important to keep your layout options open. German words, for example, tend to be longer than English words, Baxter says, so expect text translated into German to expand in length by about 30%.

The growing predominance of Internet access via wireless phones will force companies to make their sites leaner, since wireless device users don't have the time to scan as much content on a phone's small screen.

But connecting with users isn't the only issue. Once a company has lured a customer to its site, getting him to close the deal poses technical problems.

The site must have the appropriate number and size of fields to process the name, address, telephone and credit-card information, says Fred Hoch, manager of the Washington-based Software & Information Industry Association's global division.

Developers, especially, need to keep in mind different currencies, he notes, including those that don't have decimal-based structures. ■

## MORE THIS ISSUE

To learn why companies are globalizing their Web sites, see page 46.

## TECHNOLOGY FUTURE WATCH

# Welcome to Nanoworld

**Carbon nanotubes have a cult following in university science departments, but will they live up to their practical potential?**

By J. K. Dineen

**F**OR A TECHNOLOGY that's years away from practical application, nanotubes have acquired a cult-like following. Enthusiasts with names like "Nanoboy" and "Nanogirl" have set up Web sites. There's a publication called *Nanotimes*. And there are chat rooms dedicated to the latest nanotech scuttlebutt on the futuristic chat site [www.cybergen.com](http://www.cybergen.com).

So, what are these nanotubes anyway, and why are they generating such interest?

Carbon nanotubes were discovered by electron microscopist Sumio Iijima at NEC Corp. in Japan in 1991, when he was investigating the residue deposited during a process that synthesized fullerenes (a molecular form of pure carbon noted for its cage-like structures).

They're microscopic tubes made of a remarkable form of soot and have chemical properties that make them stronger than steel and lighter than plastic. They consist of concentric shells of graphite, with each shell rolled into a cylinder so the lattice of carbon atoms remains continuous. Nanotubes are stronger than metal because the chemical bond holding them together is stronger.

### High Conductivity

But nanotubes have other qualities that are whetting the appetites of engineers: They're excellent conductors of electricity and heat, and they can be used as wires, semiconductors or superconductors. They can also emit electrons, so they can be used in ultrathin display screens.

Such attributes have scientists like Shaili Fang, a vice president at CarbonLet Inc. in Lexington, Ky., convinced that nanotechnology will be used in industries within five years.

The reason, Fang says, is simple: Carbon nanotubes have a very low field-emission voltage, which means lower voltage is needed to emit the elec-

trons that produce an image.

Nanotube monitors will be so sleek, they'll be hung like posters, according to Fang. And Samsung Electronics Co. in Korea, which has demonstrated a display screen in which electrons are fired at the screen from nanotubes, estimates that it's just two years away from bringing nanotube screen to market.

"Basically, the current on conventional monitors requires a high voltage, and you need a big power supply to do that," says Fang. "If the voltage required is small ... you don't need a big power supply, and the whole package becomes much smaller."

Nanotubes could also have many other uses. Extremely small electrical wires could make use of nanotubes' electrical- and heat-conducting capabilities to make computer circuits smaller and faster. They also have the highest and most stable electron emissions rate recorded, researchers say.

Many engineers see nanotubes as an alternative to silicon, the medium in which transistors, diodes and other semi-

conductor device structures are usually built today.

"Everything is really at the beginning stages," says Phaedon Avouris, manager of IBM's nanometer scale science and technology. "Nanotubes have wonderful qualities that make them intriguing. They are strong as diamonds. They can take 100 times the current as metallic wires. They have outstanding thermal conductivity. And their atomic arrangement can be adjusted to make them behave as metals or semiconductors."

### Prizey Technology

But even if the technological properties "are extremely good," Avouris says the introduction of nanotubes will be slow because of cost and other factors. And the demand hasn't caught up with the buzz nanotubes are creating in university physics departments and at places like IBM. Currently, nanotubes cost \$100 per gram.

Given the amount of money that's been invested in competing technologies, Avouris says, he doesn't expect a speedy race to make nanotubes the building material of the next generation of electronics. "Silicon has reached a very high level of sophistication, and there is a tremendous infrastructure built around silicon," he explains. "I don't expect that, overnight, people will say, 'OK, let's drop silicon, and from now on we'll use nanotubes.'"

Avouris says nanotubes may be introduced commercially in

the next few years — first in niche applications and then perhaps in devices where silicon and nanotubes are mixed. But Prof. Charlie Johnson at the University of Pennsylvania says he's most bullish about how nanotubes will improve electrical interconnectors.

"Carbon nanotubes carry an extremely high current and carry it with such extremely little resistance, it's possible they carry current as well as it can be carried — it's at quantum limit," says Johnson, who leads a team of researchers in the department of physics and astronomy. "We do know that nanotubes can carry about 100 times the current that would destroy an ordinary electronic interconnector."

The technology will be put into practice by NASA, where researchers are exploring the possibility of using nanotubes to make a space elevator, something like the 23,000-mile satellite-to-Earth cable Arthur C. Clarke envisioned more than two decades ago.

That's one area where the cost of nanotubes is a nano-factor. "If NASA is interested in its high stability and lightness for the space program, they are not worrying about the cost of nanotubes," says Avouris. "If they are sending someone up in a spaceship, the price doesn't matter; it will cost whatever it costs."

Dineen is a freelance writer in New York.

► At left is a computer model of a short carbon nanotube consisting of almost 1,000 atoms. The cylindrical walls of the nanotube are composed of carbon atoms arranged in a superdense, hexagonal "chicken-wire" pattern, and the end caps are formed by hexagons and pentagons, which lend curvature to the caps and relieve bond strain. The nanotube depicted here is 1.4 nanometers in diameter — comparable to what is observed experimentally — but real nanotubes can be several microns long, making them perhaps the largest asper-size molecules known.

Because of their chemical structure, nanotubes are stronger than metal and superb conductors of electricity and heat. They can be used as wires, semiconductors or superconductors. Some engineers see nanotubes as an alternative to silicon, another medium for building transistors, diodes and other semiconductor devices.

- Keith A. Williams

# Security, the Web

**W**HAT IF IT MANAGERS discovered a magic way to shield e-commerce from all things illegal, such as online credit-card heists, denial-of-service attacks, Web page destruction, viruses and data thefts?

Achieving all that doesn't take a magic wand. What it does take is changing how your organization thinks about security so that the lines between security and business processes no longer exist.

It also takes an evolutionary restructuring of the security infrastructure. The goal: proactive, scalable and flexible security that can easily accommodate new applications, mergers and network changes.

"The vast majority of network plumbing gear in use today is misconfigured. We see it all the time with our clients. They bring a wire from the Internet to a switch that carries traffic to both the internal LAN and the Web server," says Stefan Jon Silverman, master technologist at Scient Corp. in San Francisco, which builds e-commerce applications for clients.

"But if you get it right — access control lists and rigid enforcement of traffic routing — nobody from the Web server can see into the internal machines," he says.

What do information security professionals want in this rebalanced, business-enabling security model?

- Code-level review of both homegrown and vendor-developed applications to ensure that they're free of common vulnerabilities.
- Distributed firewalls that provide specialized security wherever it's needed, not just at the front end.
- More granular authorization levels to support the varying access needs of business partners, corporate users and customers.
- Intrusion detection that depends less on looking for attack signatures after the fact and more on real-time monitoring of business rules violations.
- Encapsulated operating system kernels so that no applications run at the all-powerful position of root (Unix) or administrator (Windows NT).
- Centralized management consoles that blend security and networking tasks such as load balancing.

Already, some vendor tools and network security professionals are implementing such changes.

## Security From the Beginning

To minimize confusion, Ian Poynster starts with what he terms "security from the beginning." Poynster, president of security consulting firm Jerboa Inc. in Cambridge, Mass., calls this "holistic" security.

Pete van De Gohm, chief security officer at Enron Energy Services in Houston, says holistic security means showing information technology professionals, regardless of whether they specialize in security, the value of the information in their network.

Holistic security involves both network engineering and application development, Poynster says. For example, if network managers watch traffic patterns for load, why not also watch for unauthorized access? On the programming side, why not teach devel-

Today, security is often provided by patched-to-an inhibitor to business. In order to take their rig must provide distributed, real-time, flexible

## How It's Done Now

No security proofing of application code

Applications run with full access to operating system controls such as root or administration



INTERNET



ROUTER



WEB SERVER(S)

Single point of failure



FIREWALLS WITH DMZ

DMZ SERVICE NETWORK



LAN SWITCH



BACK-END TRANSACTION SERVERS

Intrusion detection done "after the fact," based on weak packet filtering

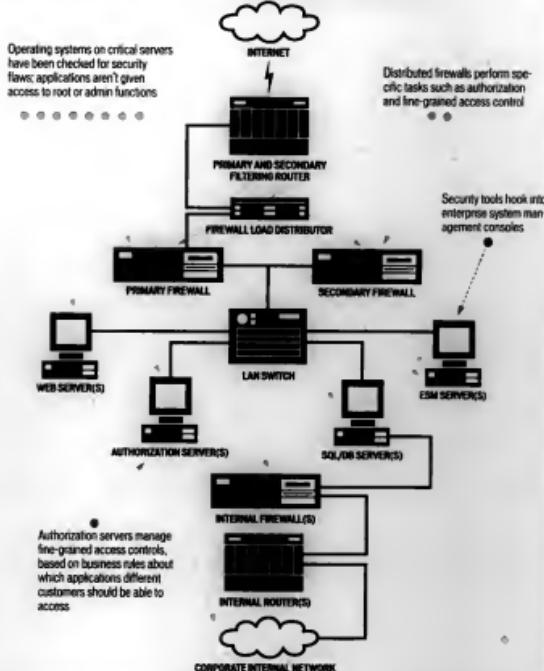
No centralized security management



# Why It Should Be

gether, reactionary defenses, which many see as a useful place as a business enabler, security systems defenses against attacks. By Deborah Radcliff

## How It Should Be Done



opers how to write code that's free of common vulnerabilities, and teach security professionals how to review this code for security problems?

But code review is typically seen as an inhibitor to business processes, adds Poynter. That's because most code review is done after the application has been developed, which results in average delays of six months, he says.

Instead, the security team should be involved in the entire life cycle of new applications. The team should sit in on development-planning meetings and calculate the security impact of an application before any code rolls off a programmer's fingertips. Then, as the application is developed — not after — the security team and the programming team should review code together, thus mitigating myriad risks without slowing development.

"Some 40% of the common vulnerabilities and exposures listed in the CVE database are buffer overflows," Poynter explains. (The CVE, located at [www.cve.mitre.org](http://www.cve.mitre.org), is a widely accepted archive of security problems found in software and hardware.) "If we can train programmers to avoid buffer overflows, then we can reduce incidents by 40%."

Code review may help in the realm of home-written applications. But how do you know what security exposures might lay dormant in vendor-developed applications? You don't, say some observers.

"If proprietary software is part of your infrastructure, it's even harder to reverse-engineer the application and see what's inside it," says Yetzer-A, a hacker-in-hiding who's a system administrator at a large East Coast Internet services firm. "Essentially, you're putting security into the hands of others."

### User Revolt?

Aside from using only open-source products such as the Apache Web Server ([www.apache.com](http://www.apache.com)) or the Linux operating system, the only solution Poynter says he sees is user revolt.

If enough large buyers say they won't buy the tool without an independent code review, vendors may also find a way to add security review into development cycles. But that will only happen if customers are willing to wait longer for product releases, something John Pescatore, an analyst at Stamford, Conn.-based Gartner Group Inc., says will never happen.

One program may hold some promise — the Common Criteria Project, part of the National Information Assurance Partnership, which is sponsored by the National Security Agency in Fort Meade, Md., and the National Institute of Standards and Technology (<http://nipp.nist.gov>).

In its lower-level evaluations, Common Criteria offers vendors (for a steep fee) a review of the security performance of their products and what exposures they bring to mixed network simulations.

So far, 14 products have passed Common Criteria evaluations (functional testing) for Levels 1 to 3 of the year-old program. Redwood City, Calif.-based Check Point Software Technologies Ltd.'s FireWall-L

Murray Hill, N.J.-based Lucent Technologies Inc.'s Managed Firewall and San Jose-based Cisco Systems Inc.'s Secure PIX Firewall are among the products that have passed.

These levels of evaluation don't include code review, which explains how a newly discovered exposure on these firewalls popped up in May, when the CVE reported that some filters and firewalls, such as FireWall-1 and Santa Clara, Calif.-based Network Associates Inc.'s Gauntlet, are vulnerable to packet fragment attacks, which are common denial-of-service attacks. These attacks confuse routing so an attacker can slip past filtering.

### Safeguards

For companies whose only line of defense is a perimeter firewall, that firewall becomes the single point of failure. What's more, the front-end firewall (or "firewall farm") also slows traffic, adding to security's bad rap as a business inhibitor.

To solve these problems, most information security professionals want to distribute firewalls throughout the enterprise.

Some, like Silverman, are getting rid of their front-end firewalls altogether. He has chosen to handle front-end traffic through properly configured routers, switches and a hardened operating system on the Web server itself.

Under this model, routers deny all traffic except that which must get through and bounce all packets they don't know how to route. On the Web server, Silverman doesn't mix Internet traffic with internal traffic. Instead, he uses network interface cards to send business partners to the right, Web traffic to the left and remote workers through the center. "If you remotely manage these Web sites, encrypt the [management] traffic," he says.

And firewalls themselves are already moving to other critical points in the network. Hence, the new term distributed firewalls, referring to firewalls that are "independent of topology," wrote Steven Bellavin, a research director at AT&T Labs Research, in a white paper late last year.

Pescatore puts firewalls in three categories.

The first category is the mammoth front-end firewall or firewall cluster. The second is the firewall appliance — a type of product that many companies are buying to shore up their branch offices. The third is the embedded firewall, which fits on PCs and is especially useful for remote workers connected via Digital Subscriber Lines or cable. An embedded firewall can also be embedded in a chip, a network



**STEPHAN JON SILVERMAN,**  
chief evangelist at  
Scient Corp., has chosen  
to handle front-end traffic  
through routers, switches  
and a hardened operating  
system on the Web server

interface card or a motherboard.

Another safeguard that blocks rogue users but lets the good guys in is the authorization server, part of what Pescatore calls "extranet access management." The authorization server is usually located somewhere at the gateway but can be distributed to other parts of the network as needed.

"I refer to these as access controls and privilege management, which are combinations of privilege to store user attributes and roles engines that implement policy, authentication and entitlement," he says.

Silverman adds that, especially in business-to-business environments, access control lists, which list who is authorized to access what, are important because they allow only certain types of traffic to be sent to predetermined destinations.

Access controls in the Unix and Windows NT operating systems can't support this level of granularity, which most companies need in order to authenticate and grant differing access privileges to business partners, customers and users.

For example, as a stock trader, "you're only allowed access to research if you have \$100,000 in your account," Pescatore explains. "If you start with this mechanism of business processes, entitlements and privileges, and those get implemented by security rules, you're golden because you don't have a separate business and security policy set."

This level of granularity is especially important as wireless devices such as personal digital assistants and cellular phones access networks. Right now, it's difficult or impossible to authenticate and grant privileges to these devices because they have varying — and inadequate — authentication capabilities.

New tools are beginning to sprout up around the extranet access-management concept. For example, some intrusion-detection systems (IDS) look for violations of business-based privileges rather than following the earlier strategy of looking at "attack signatures," according to Pescatore.

If an attacker were to hijack a legitimate user account and password, an intuitive IDS would notice when that hijacked account tried to access forbidden applications and operational controls.

"Ultimately, IDSs will tell me who's pulling competitive information away from me vs. who's doing business with me," explains Pescatore.

These new products are far from mature, he warns. "Choose these tools by how well they integrate with other management tools, your infrastructure and your high-value business applications," he says.

As companies move to a more holistic, integrated approach to security, centralized management is the only way to glue it all together. The problem is that the handful of security management tools on the market just aren't up to the job of managing complex multivendor environments.

"Even in the security management space, you have a class of companies that address Web security, a class of companies that address single sign-ons, authentication, and perhaps a [virtual private network] or [public key infrastructure]," says Jonathan Chinlitz, vice president and general manager of IntelliSoft Corp., an authentication management services division of Vasco Data Security International Inc. "What companies need is transparent integration across different tools and different architectures."

The major network management vendors — Tivoli Systems Inc. in Austin, Texas; Computer Associates International Inc. in Islandia, N.Y.; and BMC Software Inc. in Houston — have also been buying technical security companies and integrating those vendors' security products into their network and systems management tool sets.

Though imperfect, network management vendors may be the ones to drive network security deeper into the infrastructure by comingling network and security management.

That's because some technologies, such as remote firewalls and authentication servers, will already be centrally managed and therefore easier to hook into such an infrastructure, Pescatore explains. But these products must integrate with a customer's security tools and business access policies, he adds.

### Point Solutions Dead?

Randy Sandine says security managers may be able to do away with many of today's security tools once they can run truly secure operating systems.

Most applications run at the all-powerful root or admin level of the operating system because the operating system can't limit a program's privileges to just the services it needs. That's why it's so easy for executable e-mail attachments to spread viruses and malicious programs such as Microsoft Outlook.

Sandine's company, Argus Systems Inc. in Savoy, Ill., makes a tool called PitBull that partitions privileges on Unix, Solaris and Linux operating systems so no application or no single administrator has root privileges.

"What a compartmentalized operating system does is [lets] you define a compartment in which every defined process runs. Within that department, connectivity can only be established with other processes in the rule set you've predefined," says Silverman.

If attackers can't exploit an application to get to the root controls of a machine, they can't use the root to get to other applications, directories or files. "Vulnerabilities will drop significantly," says Poynter.

But he warn not to throw the baby out with the bathwater. Security infrastructure, he says, is much more than a partitioned operating system.

"It's the 'same-old, same-old' all over again. We must rewrite the way we look at security from an infrastructure standpoint," he explains. "We need to evangelize about how security can't be bought at Sears and slapped on. We must build our infrastructures correctly from the beginning. Then security really becomes the business enabler it should be."

### More on Security

- More companies are creating new security positions. See page 68.
- Next week in Business: How to sell this new approach to security to your management.

## Resources for Security Best Practices

■ [www.sans.org/topvuln.htm](http://www.sans.org/topvuln.htm) - The top 10 vulnerabilities and exposures to networked systems, from the SANS Institute

■ [www.cert.org/cisac-outlook](http://www.cert.org/cisac-outlook) - A monthly publication by the Carnegie Mellon Computer Emergency Response Team that covers various levels of information security protection.

■ [www.infosecuritymag.com](http://www.infosecuritymag.com) - An in-depth look at enterprise system management security profiles, published last month

■ <http://fep.cis.virginia.edu> - Chief Information Officers' Council of security best practices documents, primarily for government agencies, but some of the principles can be applied to the private sector

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# THIN IS IN

**Thin clients are here—and they often look surprisingly like PCs.**

By Matt Hamblen

**N**ONE DARE call thin-client computing a revolution. But putting applications and data on servers for access from thin-client devices has a certain logic that harkens back to the days when mainframes that connected to terminals were king.

The thin-client design makes sense fundamentally, according to information technology managers surveyed recently by Computerworld. Businesses are increasingly resorting to thin clients, IT managers say, to cut costs, relieve management headaches, ease software upgrades and bolster security.

Getting over user objections is the biggest downside, but it's easy once users see that they can get all the computing power they really need from thin clients, IT managers say. Of course, thin clients aren't as valuable to remote workers who are often connected from a network.

With a weight of around 10 lb. and an up-front cost of \$400 to \$1,000, thin-client desktops average half the weight and cost of traditional PCs, analysts say. But thin clients are really called "thin" because they provide access to applications and data residing on host servers and generally have no CD-ROM drives or even hard-disk drives, analysts say.

A Computerworld telephone survey conducted April 19 to 24 found that 35% of 169 businesses were using thin clients, which include Windows-based terminals, network computers and a new category of thin PCs that analysts describe as low-cost computers that eliminate some access bays, such as the \$499 iPaq from Compaq Computer Corp. (See "A PC or a Thin Client?" on page 63.) Another 22% of those surveyed plan to install such devices in the future.

Worldwide shipments of Windows-based terminals and network computers nearly doubled from 370,000 in 1998 to 700,000 in 1999, with an annual growth of 66% expected in the next five years, according to International Data Corp. (IDC) in Framingham, Mass. Those forecasts don't include handheld computers, smart phones or even those new thin PCs that several large vendors are hyping.

Yet thin clients are still a small part of the overall market. There were 113 million desktop PCs and nearly 20 million notebook PCs sold worldwide last year, IDC said.

"If you look at the big picture, you save so much on deployment and maintenance costs that it makes [a server-based design] worthwhile," says Alton Hall, a senior network engineer at Howard Hughes Medical Institute in Chevy Chase, Md. "There's a lot of reasons to go this way."

#### FULL CIRCLE

Business computing has evolved almost full circle with thin clients. Initially, mainframes contained the processing power and were connected to terminals. Later, processing was shared among powerful desktop PCs and servers. Now, processing is shifting to centralized servers that reach out to thin clients.

Today's thin clients differ from the old terminals mainly because they have Windows or similar graphical interfaces rather than text-based ones. Some new terminals allow Web-browsing functions as well, and some even have hard drives used to cache data. However, if the hard drive is launching applications and storing data, purists say it's really a PC.

Modern thin PCs such as the iPaq are considered the outgrowth of the network PCs introduced in 1997 by



If you look at the big picture, you save so much on deployment and maintenance costs that it makes [a server-based design] worthwhile.

ALTON HALL, SENIOR NETWORK ENGINEER,  
HOWARD HUGHES MEDICAL INSTITUTE

# TECHNOLOGY

Hewlett-Packard Co., Dell Computer Corp. and Compaq. Those seem to have been spawned from Oracle Corp. CEO Larry Ellison's notion of the network computer in 1995. But the network PC didn't catch on, analysts say.

"I believe most PCs will evolve into being thin clients, and it will be the standard way in which systems operate, with servers managing the heavy lifting," predicts Greg Blatnik, an analyst at Zona Research Inc. in Redwood City, Calif.

Growth in application service providers and Microsoft Corp.'s June 22 announcement of its Microsoft.Net vision for sharing applications over the Web show the level of interest in using small and thin devices to access information remotely, Blatnik adds. "This is a quiet evolution and not a revolution," he says.

## DOWNSIDES

There are some downsides to the thin-client architecture. The biggest problem mentioned in the Computerworld survey was user resistance to giving up control of fully functioning desktop PCs, an issue cited by 21 of 59 IT managers.

Some managers and analysts said other drawbacks include the need to upgrade servers and the need to buy server applications and licenses.

But those concerns are almost trivial compared with the advantages, according to interviews with 16 IT managers. Several said their companies are testing thin-client devices. But before moving to them, they're getting the full investment from their current PCs by using them to connect with server application software such as MetaFrame from Citrix Systems Inc. in Fort Lauderdale, Fla.

That software resides on a server and allows the server to connect with 100 different client machines through the Citrix Independent Computing Architecture installed on the client. This allows the presentation of tabulations to be performed on the server without, in many cases, passing entire files over a network.

Howard Hughes Medical Center has 650 remote users who use HP workstations with the Citrix client software for quick remote access to PeopleSoft Inc. human resources and financial applications on 12 centralized servers, Hall says. "This design allows us to centralize management of applications here, rather than on hundreds of workstations, which is much easier to deploy and maintain, and cheaper," he says.

Moving to thin clients "cuts some expense to maintain the machines, and by centralizing, we can hook into databases easier for analyzing data," says Matthew Paige, manager of technical services at Quebecor World Inc. in

*Continued on page 65*



## A PC or a Thin Client?

A device that blurs the lines between a thin client and a full-blown PC is being deployed by eScreen, a start-up selling an online drug-screening service to employers nationwide.

The company, based in Kansas City, Kan., says it can give employers a negative result on a drug screening of a urine sample within an hour, much faster than the time to these days was required. Readings deemed positive are double-checked via a traditional screening method (urine sample of three cups), if needed.

eScreen officials say the company's product provides much faster processing than the thin client terminals, at a slightly lower cost and with easier Universal Serial Bus (USB) connections, say eScreen officials. eScreen created a patented urine cup (trademarked "eCup") and digital reading device (trademarked "eReader") that looks like a coffee machine. Both are linked with cables to a PC desktop, which are linked over networks to an eScreen server, where the actual drug analysis calculation is done, eScreen officials say.

Analysts say the process sounds unusual. If not unique, and the project has helped persuade Compaq officials to consider marketing as thin-client replacements.

eScreen has installed its devices and 280 iPacs in clinics around the country, with plans to increase the number to 3,000 by year's end, says Bill Whiford, eScreen's chief operating officer. The company has a contract with a 3,000-outlet retail chain that sells the cups to use the eScreen service of 1,000 locations by year's end, he adds.

### Thin PC

Technically, Compaq's Pac isn't a thin-client machine but a thin PC. It is connected to the eReader and transmits the urine data reading and input identifying the sample over a virtual private network to a server that calculates whether drugs might be present.

In comparison, a true thin client from Network Computing Devices Inc. (NCD) in Mountain View, Calif., didn't perform as well when tested eight months ago, Whiford says.

"The application ran when we tried the Terminal Server product from Microsoft on the NCDs, but it was really slow," Whiford says. Whiford estimates that it took up to 20 seconds to load and transmit a page on an NCD client but less than one second with an iPaq.

The iPaq works faster because eScreen's database and most of

its applications run on its Microsoft SQL-based server in Los Angeles, but user interface screens for taking patient information are run on the Pac clients, he says.

Only the data passes over the network, not the entire screen of information, which explains the faster speed, Whiford says. "It's a fast processor sending the words and not the entire screen shot," he explains.

With the NCD products, there was no application on the client, meaning much more data needed to be transmitted.

eScreen has set up each iPaq with input from its eReader, a bar code reader, a keyboard and mouse.

### Price Savings

The drug-screening company gets the benefit of a compact desktop that runs some applications, yet the basic iPaq costs about \$499, almost the same price as traditional thin clients that boast fewer functions, Whiford says.

The iPaq runs Windows 2000 and allows easy connections to the eReader and other peripheral devices because of its USB ports, which the NCDs don't have, Whiford adds. eScreen also got the Windows 2000 Client Access License, estimated to cost about \$80, in the \$499 price but would have had to pay extra for that license if the company purchased a traditional thin client, he says.

Compaq was the first on the market to introduce January with the new category of thin PCs, although Hewlett-Packard has released its own thin clients, the e-Workstation and Dell and IBM have plans for competing products, analysts say. The thin PCs have all done away with serial ports, are half as heavy and much less costly than traditional desktops and have limited upgrade capabilities.

Analysts place the iPaq in the PC category because it has a hard drive as well as an access bay for a CD-ROM, second hard drive, DVD or high-capacity floppy.

Compaq has been selling iPaq machines both as PCs and as thin-client alternatives, and the company reports sales to above its expectations, says Roger Key, an analyst at IDC in Framingham, Mass.

Compaq officials said they're surprised at how much interest there is in the iPaq as a thin-client alternative but won't discuss sales numbers. — Matt Hembalek

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# TECHNOLOGY

# THIN IS IN

Continued from page 67

West Hollywood, Calif., which processes printing layouts prior to printing.

Users couldn't quantify their savings from reduced maintenance costs or other factors, but analysts at Stamford, Conn.-based Gartner Group Inc. say the consensus of their customers is that "fat" PC clients and applications require at least five times more support staff than thin clients.

## THE ADVANTAGES

The Computerworld telephone survey showed that thin clients provide several advantages, including easier management, maintenance and support and software distribution, followed by lowered total cost of ownership. And in terms of rapid deployment of applications, Gartner analyst Peter Lowber cited one company he wouldn't name that upgraded 3,000 Windows terminal users at 30 sites worldwide to Office 2000 in four hours. It would take at least three months to upgrade that many PCs, he says.

Manageability was the key reason Genuine Parts Co. in Atlanta, parent of the National Automotive Parts Association (NAPA) retail chain, signed a deal in March for 65,000 point-of-sale terminals from Netier Technologies Inc. in Dallas.

About 6,200 NAPA stores nationwide will get NetExpress XI2000 terminals running the Windows NT embedded operating system in the next three years, in a deal valued at about \$70 million, according to Netier and Genuine Parts. The machines replace dumb terminals and will bring the advantage of a familiar Windows-based desktop to users, says Jay Burnsworth, NAPA's vice president of IT.

Computerworld's survey shows that 25% of the 59 thin-client users have re-

placed older thin-client terminals with newer ones.

"I can't even imagine trying to manage 60,000 PCs," since that might take hundreds of support staff, Burnworth says. "This way, we have automatic configurability with software upgrades."

Security and control are important reasons for using thin clients as well, IT managers say.

"With thin clients, we eliminate the possibility of a client-side virus, since there's no way to input data other than on the keyboard," says Dave Hendrie, manager of information systems at Daewoo Motor America Inc. in Compton, Calif.

The Korean automaker is installing Wyse Technology Inc. Wintern 3350s at 450 auto franchises nationwide, a process that should be completed by next month, Hendrie says. Daewoo had deployed PCs at dealerships but replaced them with thin clients for improved security and central management.

"The users affected by the Melissa virus probably have too much functionality for what they need and forget that desktops are for business purposes, and we decided we want to keep doing business," Hendrie says.

Another feature of working over the network is server load-balancing, users say. At Daewoo, for example, simultaneous users can reach one of 12 servers in Compton, with the load balanced over all 12 to avoid delays, Hendrie says. Before, users could pound one server until it crashed.

Hendrie says some users objected to losing desktop PCs, as Computerworld found in its poll. But since dealers have received the thin clients, Hendrie says, "they realize it will do everything they need." The dealers mostly need access to corporate data on the cars they sell and have full Web-browsing capabilities if they want to compare prices.

Some dealers can integrate payroll and credit-reporting functions that formerly ran on PCs on the Wyse terminals through terminal emulation, Hendrie says.

Employees at Community First Bank Shares (CFBS) in Fargo, N.D., have found that using thin clients allows them to off-load technology tasks, such as backing up data (now done on servers), so they can spend more time with customers, IT officials at the bank say. CFBS has about 3,000 Wyse Wintern thin-client workstations.

Lowber says managers should realize that users moving from PCs to Windows will have access to the same applications with fewer reboots. "The PC has become a network appliance," he says. "Many PC users hardly ever use the diskette or CD-ROM drives because their information needs are met via the network."

## Slimming Down Is Looking Up

**SURVEY BASE:** 59 thin-client managers of U.S.-based corporations responding to a telephone survey by Computerworld in April '00. **20%** of users are in a large or medium office for the overall poll. **For the survey:** Computerworld's telephone survey of 59 thin-client managers of U.S.-based corporations. **Definition:** A thin client is a computer server over a hard-wired connection to a network and is configured to maximize the ease of management and to reduce total cost of ownership. This clients are traditional Windows-based terminals or dumb terminals, usually located at a user's desk, while thin PCs are an emerging category that includes PCs in which certain functions are loaded out or new designs in which a hard drive is used, but other components such as CD-ROM bays are not.

### Usage of thin clients and thin PCs

59 of 109 managers, or 54%, said they use thin clients or thin PCs.

Of those 59, another 22% said they would install thin clients or thin PCs in the future.

Of those 59 with thin clients installed, 89% had thin clients or thin PCs, 88% had terminals and 87% had network computers. (Some companies had more than one type.)

BASIC 109 RESPONDENTS

### Reasons for installing thin clients

Easy management, maintenance and support 88%

Easy software distribution 88%

Ability to maintain standards on users' desktops 58%

Lower total cost of ownership 47%

Increased security 34%

BASIC 59 RESPONDENTS

### Which problems have you had with thin clients in your organization?

Resistance of users to give up control of their desktops 88%

Incompatibility with applications 26%

Pot too much load on network 18%

Remote administration from central console more difficult than anticipated 14%

Availability of applications 12%

Price of applications 12%

BASIC 59 RESPONDENTS

## PCs Getting Smaller, Market Getting Bigger

Compaq's iPAQ is turning popular, but there are plenty of other thin-client options

**Motorola NetXpress XI2000**  
Used by Napa



**Motorola NetXpress XI2000**  
Used by Napa  
Technologies, Inc., Carrollton, Texas  
Price: Starts at \$799  
Features:  
Windows CE

Embedded Windows and Linux operating systems; one serial, one parallel and two USB ports  
Weight: 12 lb.

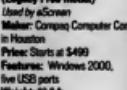
**Wyse Wintern 3350SE**  
Used by Daewoo



**Wyse Wintern 3350SE**  
Used by Daewoo  
Technology Inc. in San Jose  
Price: Starts at \$747  
Features:  
Windows CE;

two serial, one parallel and two USB ports  
Weight: 8 lb.

**Compaq iPAQ (Legacy Free model)**  
Used by Ciscan



**Compaq iPAQ (Legacy Free model)**  
Used by Ciscan  
Computer Corp. in Houston  
Price: Starts at \$499  
Features: Windows 2000, five USB ports  
Weight: 10.6 lb.



# Making Web Sites Open to Discussion

**Online chat software from Cahoots brings Web site visitors together**

BY DAVID ESSES

**W**HEN ISRAELI engineer Eliad Hemar was searching a university Web site in 1998 and couldn't find an answer to his question, he wanted to ask someone, anyone, for help. But in the vacuum of cyberspace, there was no one to hear his plea.

So Hemar and several partners decided to design a program that would give Web surfers live, direct links to site personnel through "chat" windows. From that idea came Cahoots Inc. in Brisbane, Calif., and the Cahoots Live Web-Wide Communication Network launched in March. The basic service is free to both users and Web sites.

Ferrari North America Inc. in Englewood Cliffs, N.J., is an early user of the technology its site, Ferrari.com, receives 2 million hits per day from 150,000 weekly visitors with an interest in the Italian sports car. CEO Greg Crotty says he's used Cahoots for six months as a way for Ferrari enthusiasts to connect. He's noticed an up tick in traffic, which may be generating more business for his used-car section.

"They are congregating around my Web site and our product," Crotty says. "If you are a business site, that's a great benefit. All of the other chat networks claim to have community, but the user has to search for it or create it and wait to see if someone comes to you."

## Getting in Cahoots

According to Cambridge, Mass.-based Forrester Research Inc., 90% of Web sites will have some type of real-time interactivity by 2003.

Cahoots CEO John Rizzo says his company helps information technology managers with one of their toughest

challenges: promoting brand loyalty at e-commerce sites. "It allows us to make their site more valuable without having to engineer it in," he says. "We live-chat every page on [a] customer's Web site without the IT department having to get involved."

To use Cahoots, visitors

download Cahoots LS, a free 2.3MB program, from [www.cahoots.com](http://www.cahoots.com) or a participating Web site. Anyone who has the software can exchange live messages in a pop-up window that shows the names of other people on the Cahoots network who are visiting the same site. If your PC has speakers, they can talk to you; if you have a microphone, you can reply.

Unlike messaging and chat software such as America Online Inc.'s Instant Messenger or



**CEO John Rizzo helped launch Cahoots as a service to let Web site staffers answer visitors' questions.**

## Cahoots Inc.

**Location:** 2000 Sierra Point Parkway, Suite 301, Brisbane, Calif. 94005  
**Telephone:** (650) 534-1010  
**Web site:** [www.cahoots.com](http://www.cahoots.com)

**Niche:** Real-time end-user instant messaging and voice chat services for Web sites

**Why it's worth watching:** If it can build a critical mass of users, Cahoots.com will be useful for creating site "stickiness" and managing customer relationships online.

**Company officers:**  
John Rizzo, CEO  
Kanner Elshay, co-founder and chairman

Yairiv Iry and Ronen Babayoff, co-founders and co-chief technical officers

Eliad Hemar, co-founder and chief operations officer

**Bottom line:**  
• September 1998 Founded  
• March 2000: Cahoots Version 1.0 released

• June 2000  
Cahoots Version 1.5 and Cahoots for Site released

**Employee:** 41 100% annual growth rate projected  
**Burn money:** \$16.5 million from Kanner Elshay, Seven Rosen Fund and several others. \$25 million round under way

**Services/pricing:** Basic service is free; Cahoots for Sites starts at \$300 per month per site

**Customer:** ETrade, Eddie Bauer, ESPN, Fenway Homestays.com and Universal Pictures

**Major success:** ETrade equity stake announced June 27 (amount undisclosed)

**Rod Baggs for IT:**  
• Will enough users download the client?

• Long-term viability depends on sales of Cahoots Version 2.0.  
• Testimony that features are available from other sources.

Tribal Voice's PowWow, Cahoots ties communities to Web sites, giving the sites' owners direct contact with visitors and some control over the relevance and usefulness of the community's discussions.

There's no performance hit on the participating Web site because Cahoots directs traffic through its own Web servers. And because Cahoots creates a live IP connection, sites can offer other amenities such as phone calls over IP and the ability to post notes on Web bulletin boards.

A customer service representative can be the one at the other end of a messaging window. When used this way, Cahoots is a basic customer relationship management tool, making it possible to give guided tours of sites and provide timely technical support.

Last month, Cahoots upgraded its software and added other features, including file transfers, message encryption and the ability to hold private group conversations without going through a public Web site.

The company also introduced Cahoots for Sites, a premium service that adds a site representative icon to the viewer's chat window when he visits a participating Web site, as well as moderator tools for the site representatives. The software starts at \$300 per month for each customer service representative.

Cahoots for Sites is the centerpiece of the firm's business model.

The question is, will Web sites pay?

ETrade Securities Inc., in Menlo Park, Calif., recently announced an equity stake in Cahoots and will use Cahoots for Sites for its 2.6 million users. Eddie Bauer Inc., Wired magazine, Six Flags Theme Parks Inc. and several other companies have posted download links on their sites.

Crotty says he plans to move to Cahoots for Sites soon. With it, he hopes to avoid needlessly losing potential customers.

"People are asking, 'Is somebody there? Is this the right thing?'" Crotty says. "I've emptied a lot of shopping carts in my time."

*Esses is a freelance writer in Antrim, N.H.*

## the buzz STATE OF THE MARKET

### The Talk Show

Cahoots has company in the market to help Web sites build communication links to customers. Besides competing with similarly focused Web communication software, Cahoots faces full-service customer relationship management (CRM) packages that be able to add call centers and mine the resulting data. And its community-building features are partly duplicated by popular messaging and chat software.

"In a sense, it's a very small point solution," says Sherry Chen, an analyst at Gartner Group Inc. in Framingham, Mass. Cahoots has momentum right now, but if it needs partnerships to get a foothold in a market where no company has a single comprehensive solution, Chen says.

For larger companies, packages from Kana Communications Inc. in Palo Alto, Calif.; Genesys Telecommunications Laboratories Inc. in San Francisco and Syncrhony Communications Inc. in Cincinnati provide enterprise-level, with some of the same communication options as Cahoots.

Products like Hackensack, N.J.-based Net2Phone Inc.'s Click2Talk, which puts Web servers through to a site's toll-free phone bank, provide a more limited telephony option. And instant messaging and chat vendors will take Cahoots' turf as they add telephony features, say competitors.

### FaceTime Communications Inc.

Foster City, Calif.

[www.facetime.com](http://www.facetime.com)

A direct competitor of Cahoots, FaceTime lets Compaq Computer Corp., Western Union and WigginsBank communicate among its systems. "They use us as sort of a best-of-breed, real-time communication system," says Rob Saldan, FaceTime's vice president and general manager. Though the company changes a monthly fee similar to Cahoots, Saldan says it focuses on helping businesses build a complete "CRM" platform by offering additional software for analyzing CRM data.

### FireTalk Communications Inc.

South San Francisco

[www.firetalk.com](http://www.firetalk.com)

FireTalk Communications uses a downloadable client program to set up the information provider channel. But FireTalk emphasizes large-group communication for promotional events, such as chats with famous people that take place in "virtual auditoriums" with up to 1,000 people. —David Esses

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# First Line Of Defense

**With security among the most important business issues, many companies are creating new IT positions to take charge of both the technology and the politics.** By Deborah Radcliff



PAUL RAINES  
Former chief security officer,  
Federal Reserve Bank of New York

**P**AUL RAINES cut his security teeth in a very paranoid world. He was a handler of the keys used to launch Minuteman nuclear missiles for the U.S. Air Force. Several promotions later, he landed the responsibility for securing Air Force command and control communications.

"My real baptism in encryption came when I worked at the U.S. Postal Service between 1993 and 1996," says Raines, 42. There, he and his team developed the certificate authority infrastructure behind the Post Office's digital postage program. In the past two years, the postal digital certificate program has issued

more than 500,000 certificates, which are used to authenticate downloads to, and draws from, a user's digital postage meter.

In 1996, Raines took a director-level security position at the Federal Reserve Bank of New York. With him, he brought two of his team leaders from the Postal Service — one to develop and supervise user policy training and enforcement and the other to hire and supervise a Red Team (four Federal Reserve security staff members who hack the Reserve's systems to test for vulnerabilities). The Blue Team, responsible for access controls and security services to the Reserve's business areas, already existed.

Combined, 23 of Raines' re-

ports hold some type of information security job, but not many of these are direct reports, he says. He's too busy in executive offices, evangelizing and building interagency relationships, to form close relationships with these workers.

"The types of issues I deal with tend to be policy-related. Like, 'How do we coordinate software reviews between all the Federal Reserve Banks so we don't reinvent work?'" Raines explains. But maybe he shouldn't have opened his mouth — he now coordinates those efforts from banks.

The other part of his job is crisis management. Take, for example, the time Raines was sipping a double espresso at a Starbucks at 6:30 a.m. the day the "I Love You" virus struck. "I took one look at the paper and called our network people from the train station, telling them to shut down our mail server," he says with a chuckle. "Thankfully, by the time I got to work, they had already up-dated the virus pattern."

## Fast-Moving Field

Historically, security is a moving target. Threats, security tools and security policy models have already gone through several iterations in the past 10 years. Thus, chief security officers (CSO) must also possess the ability to seed and execute change at the cultural level, says Pete De Gohm, CSO at Enron Energy Services in Houston.

That requires a certain amount of political savvy, since the job involves wooing the support of the nontechnical CEO while leading the company into the next security shift: proactive, holistic security attended to by every level of the organization.

The CSO position calls for a rare bird in the technical community, according to Tracy Lenzner, president of Lenzner and Associates, a Las Vegas-based security management consultancy.

For this reason, former military leaders like Raines and van De Gohm make great CSOs, says Lenzner. She adds

"Without security, n company's infrastructure can be completely destroyed. The chief security officer is the most important black hole. That's why it ranks a chief officer."

Tony Carr, vice president of technical recruiting, networking specialty, at Personics Systems Inc., a job placement firm in New York

that there's an equal ratio of CSOs who have corporate backgrounds in the field. (Van De Gohm also did a Minuteman stint in an Air Force missile silo in South Dakota before overseeing both physical and technical security of the Shadow jet development facility in southern California.)

"The key is the ability to execute," Lenzner says. "People with military backgrounds make excellent leaders because they learned in the military that when given a job, they overcome obstacles and they execute."

## Security Blanket

**WHO:** Paul Raines

**TITLE:** Chief security officer

**WHERE:** Federal Reserve Bank of New York

**REPORTS TO:** COO

**CREDENTIALS:** Raines represents information security for the Federal Reserve at the Bank for International Settlements in Switzerland; he's also a published security pundit and speaker on internal security policy, encryption and international electronic banking issues.

**SALARY:** Chief security officers can expect \$100,000 to \$250,000, depending on the industry, according to Tony Carr, vice president of technical recruiting, networking specialty, at Personics Systems Inc. in New York.

**DEMAND:** Chief security officers are needed at companies that have highly valuable information assets or intellectual property and a Web presence.

## Characteristics/ Backgrounds:

- Had similar role in same or like industry, or is ready to step up a notch
- Able to execute senior management responsibilities such as presentations, direct management, business development and executive teamwork
- Political ability to leverage ideas, concepts and technology within changing global environments
- Hands-on technical background
- MBA, computer science degrees preferred

Source: Tracy Lenzner, president of Lenzner and Associates, a Las Vegas-based job placement firm for technology managers













# WEEK IN STOCKS

75

	PERCENT	PERCENT
DOLLAR	DOLLAR	DOLLAR
Bell Atlantic Worldwide (L)	+9.3	\$10.30
Westell Telephone Co.	+8.4	\$10.40
Cybercash Inc.	+6.7	\$10.40
Spyglass Inc.	+6.6	\$10.40
Tricor Systems	+4.3	\$10.40
Scientific Atlanta (H)	+4.3	\$10.40
Westel Communications Inc.	+3.4	\$10.40
Tektronix	+3.4	\$10.40
Chelicorp Software Techn. Ltd.	-10.00	\$10.00
Tilco Software Inc.	-10.00	\$10.00
Scientific Atlanta (H)	-10.00	\$10.00
Juniper Networks Inc.	-9.35	\$9.65
Tektronix	-8.80	\$9.80
SysNet	-8.40	\$9.60
Veritas Software Corp.	-7.90	\$7.90
Adobe Systems Inc. (GD)	-7.44	\$7.44

	PERCENT	PERCENT
DOLLAR	DOLLAR	DOLLAR
Entropic Technologies Inc.	-98.8	\$0.00
Computer Assoc. Int'l Inc. (L)	-94.4	\$0.00
BMC Software Inc. (L)	-94.4	\$0.00
Informix Software Inc. (L)	-94.4	\$0.00
GlobusNet Telecom	-92.0	\$0.00
Lemans International Group Inc.	-91.1	\$0.00
Siemens Sciences	-91.0	\$0.00
Artemis Software Inc.	-89.50	\$0.00
Computer Assoc. Int'l Inc. (L)	-87.00	\$0.00
BMC Software Inc. (L)	-86.00	\$0.00
Hirsch Ltd.	-86.00	\$0.00
NHC (H)	-85.84	\$0.00
Entropic Technologies Inc.	-85.00	\$0.00
Business Objects S.A.	-77.90	\$0.00
Oracle Corp.	-6.76	\$0.00

## CA, BMC Won't Meet Expectations

**Stock prices plummet following announcements**

BY LINDA ROSENTHAL

**S**OFTWARE MAKERS Computer Associates International Inc. and BMC Software Inc. last week warned of first-quarter shortfalls, which they attributed in part to weak European sales and a slump in their mainframe-management software businesses.

In a conference call to analysts last week, CA President and Chief Operating Officer Sunjay Kumar said he saw the Islandia, NY-based company expected to earn between \$11 and 16 cents per share in its first fiscal quarter ended June 30, lower than the 55 cents predicted by a First Call/Thomson Financial survey of Wall Street analysts.

In morning trading July 3, the day af-

ter CA [NYSE:CA] first announced the expected shortfall, the company's stock price at one point fell 45% from \$51.13 per share to \$28.50, a new 52-week low.

Paul Rodriguez, managing director of C. E. Tuerberg, Towbin in New York, says CA's revenue shortfall resulted in part from IBM's [NYSE:IBM] production cycle. IBM has postponed shipping the G7 mainframe computer until late this year or early next because of a change in its pricing structure. Rodriguez says, "IBM is thinking about charging for what you use, so customers are waiting to see what the [pricing] is."

On July 5, business software maker Novell [Nasdaq:BMCIS] in Houston also said its profit for its first quarter ended June 30 would fall short of analysts' predictions. In a statement, BMC said it expected its net earnings to come in between \$47 million and \$51 million, with per-share earnings of 18 to 21 cents. Wall Street analysts had predicted 46 cents per share.

"We experienced weakness in our mainframe business at quarter end," BMC Chairman, President and CEO Max Watson said in a statement. "We attribute the shortfall in mainframe license revenues to a lack of a sufficient number of customers committing to enterprise license transactions."

After the announcement, BMC's stock price tumbled 38% to a new 52-week low of \$22 per share after starting the day at \$35.50.

"We believe the mainframe weakness will persist into the fall, and possibly into [December], when G7 moves into full swing," says Christopher Shilakes, an analyst at Merrill Lynch & Co. in New York. "We think CA's and BMC's stocks will likely remain depressed."



	PERCENT	PERCENT
DOLLAR	DOLLAR	DOLLAR
Ameritech Corp.	-10.00	\$10.00
AT&T Corp.	-9.80	\$10.00
AT&T Wireless Services Inc.	-9.70	\$10.00
AT&T Corp.	-9.60	\$10.00
AT&T Corp.	-9.50	\$10.00
AT&T Corp.	-9.40	\$10.00
AT&T Corp.	-9.30	\$10.00
AT&T Corp.	-9.20	\$10.00
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KEY: GD = New annual high reached in period  
GD = New annual low reached in period  
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# THE BACK PAGE

FRANK HAYES/FRANKLY SPEAKING

## Final notice

**E**VER NOTICE HOW, every few months, some high-profile Web site forgets to pay its domain-name registration fee and loses its connection to the Net? In June, it was Wall Street's J. P. Morgan & Co., whose site disappeared after someone forgot to pay the renewal fee for [jpmorgan.com](http://jpmorgan.com). Last December, it was Microsoft's Hotmail free e-mail service that went down on Christmas Eve for the same reason. Morgan ponied up the renewal fee itself to get back online; in the Hotmail case, a generous Linux consultant kicked in the \$35 to restart the service.

Domain-name deadbeats are so common these days that Network Solutions Inc. is auctioning off a batch of domain names that customers registered for but didn't pay for. (Contrary to some news-

paper reports late last month, NSI didn't just send out pay-by-Wednesday-or-get-auctioned notices. The company says it has been dunning those customers for months.)

And it's not just unpaid domain-name bills that can get businesses into trouble. Software license fees, bills from Internet service providers and application service providers — if they don't get paid, a department or a whole business could be shut down overnight.

And too often, they don't get paid. A bill just falls between the cracks. Maybe the guy who used to pay it changed jobs. Or the company moved. Or e-mail addresses changed. Or everybody thinks another department is supposed to pay it. Whatever the reason, the result is a mess — or worse.

Let's face it: it's easy to forget about some of these Web-related bills. A domain name costs between \$15 and \$35 per year — wildly out of proportion with its importance to your business.

And while Web server licenses may cost more, sometimes it's hard to figure out exactly who's supposed to cut the check — IT? A user department? A business partner? Any confusion will just get worse as you get deeper into business-to-business e-commerce.

Worse still, under UCITA, the Uniform Computer Information Transactions Act that has already passed several state legislatures, software vendors can build an "automatic restraint" into their products that disables the software once the license expires. Forget to pay that bill and the software may simply stop working. And if it

stops working, users won't turn to accounts payable. They'll point the finger at IT.

So what can we do to make sure things keep working? Never mind tying a string around your finger. Just make a list.

Make a list of all those fees and licenses and the dates they'll come due. Internet service provider and application service provider contracts, domain-name registrations, software licenses — hunt them all down, especially the ones IT isn't responsible for paying.

Then choose a few people to monitor and maintain the list. Their job will be keeping the list updated, reminding the bill payers when the due dates get close and warning management if a user department or business partner seems to be letting it slide.

And then create a policy — a clear, unambiguous set of rules for what should be done and when. You'll need your upper management's support for this, because you'll have to develop the policy with other departments and divisions, and maybe even other companies.

But it'll probably take longer to hammer out that policy than to inventory all the bills to pay. The politics may get ugly. The negotiations could get painful.

So first, make that list. Start making it today. Because if your site or your software shuts down because a bill isn't paid, no one will forget whom to blame. ▶

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is [frank\\_hayes@computerworld.com](mailto:frank_hayes@computerworld.com).

## SHARK TANK

IT'S GO/NO-GO decision time for this major administration system project, and the CIO, programmers, users and senior executives are in a meeting haggling over whether to move the new code into production. The users aren't happy with the test results — they want a delay until problems are fixed. Finally, the CIO shuts down the discussion, deciding, "We need to move this code into production if you want it fixed. That's where we have the controls!"

### UNCLEAR ON THE CONCEPT

During a performance review, this developer plots fish grousing about how stable the systems are — they don't offer any opportunities for debugging or other problem-solving. Her manager suggests a solution: Maybe the fish could introduce her own "bugs" into the system and then work on solving the problem.

HE GETS IT Senior IT pilot fish is looking over some framework JCL code that seems to have unnecessary statements — nothing.

ing that will cause problems, but they're clearly superfluous. He asks the junior pilot fish who's maintaining the code. "Don't you understand this?" replies junior. "I took the time to understand everything I did. I'd never get anything done!"

**MANAGEMENT PILGRIM** At a business-to-business Internet start-up report the following conversation with a local venture capitalist: "We really like your plan. It's easily the best B-to-B plan we have seen." "Great," says the fish. "However, before we would feel comfortable investing, we would like you to invite a couple of industry players and get investments from them," says the VC. "OK, but if we got the industry players to invest, why would the VC ask?" asks the fish. The VC replies, "You know, that's a very good point..."

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**Delegate a crew to monitor all Web site payables.**



## The 5th Wave

PROFESSORANT



"They both traveled a lot and were big Internet users. Finally, three years and two moves later, they broke up due to insufficient bandwidth."

Illustrations by Michael Kupperman



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